FLIGHT, AUGUST 4, 1938 FIRST AERO WEEKLY IN THE WORLD REGD. AT THE G.P.O. AS A NEWSPAPER

AUG 15 1938

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The AIRCRAFT ENGINEER AND AIRSHIPS

1545 XXXIV

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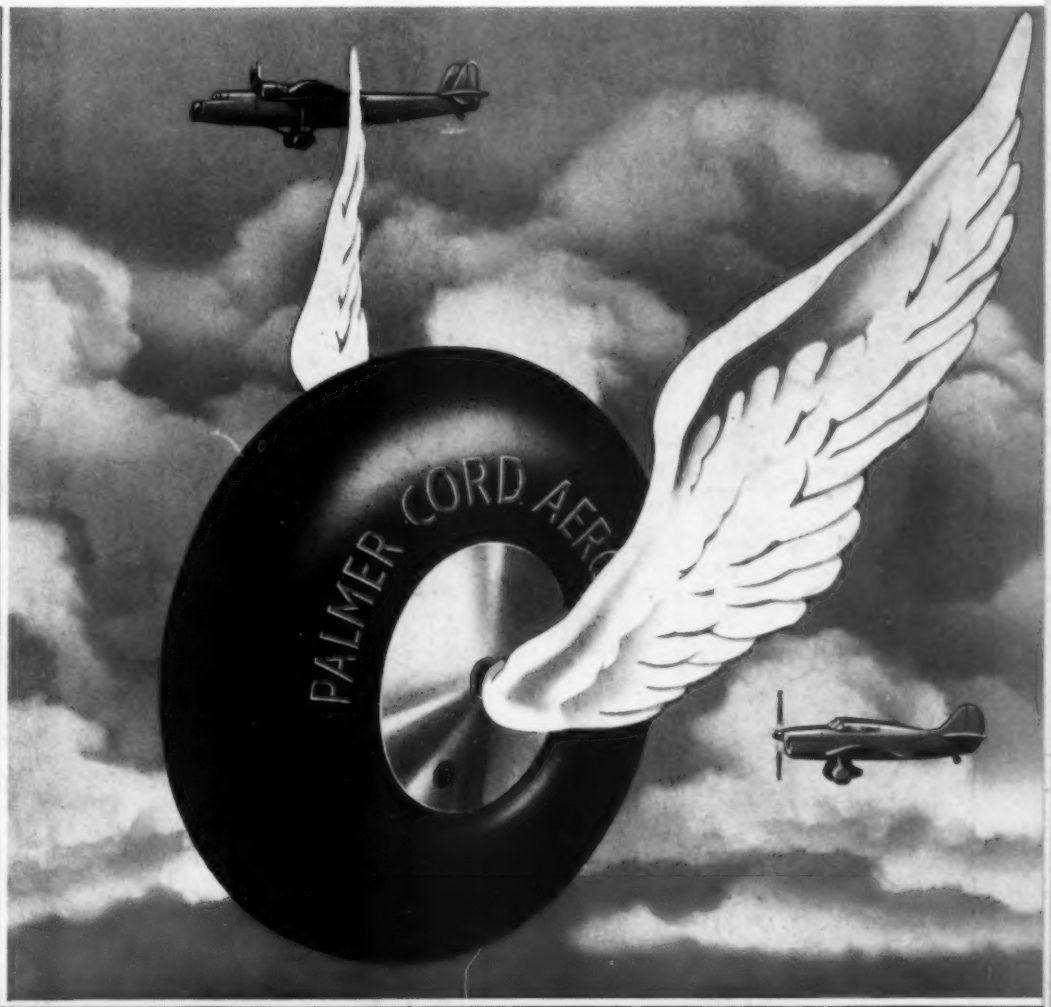

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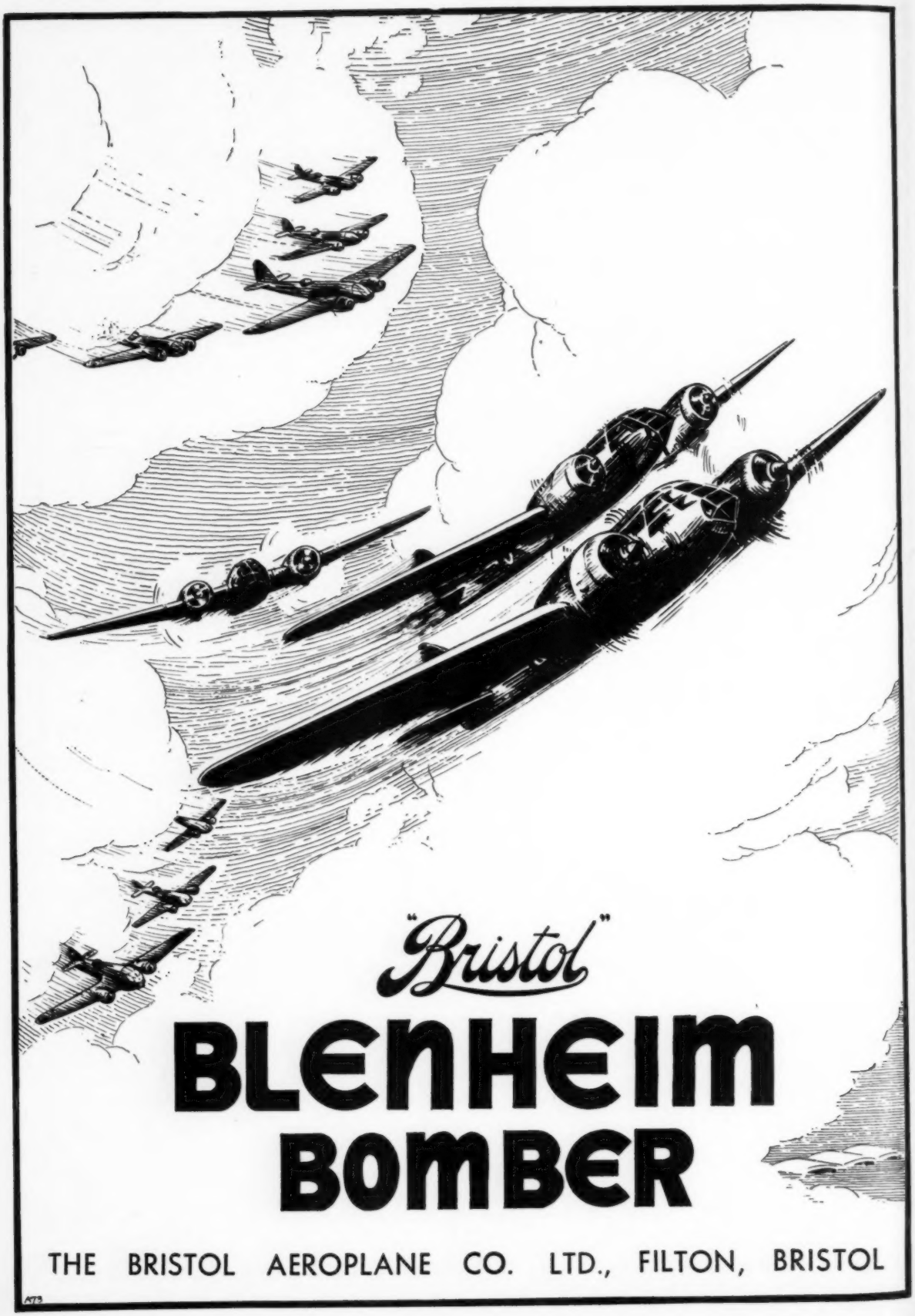

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FLIGHT

The AIRCRAFT ENGINEER AND AIRSHIPS

FIRST AERONAUTICAL WEEKLY IN THE WORLD : FOUNDED 1909

Editor C. M. POULSEN

Managing Editor G. GEOFFREY SMITH

Chief Photographer JOHN YOXALL

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The Outlook

Festina Lente

THE Civil Air Guard scheme has come in with a rush. The Air Ministry forms will be ready and sent to the light aeroplane clubs by about the middle of the month. When the clubs have issued the forms to applicants and had them returned duly completed and the medical certificate has been sent to the Air Ministry the clubs will be able to start instruction. With any luck that may be at the beginning of September, and some clubs may be in a position to start instruction at the cheap rate at about that time.

This will apply only to those clubs whose aeroplanes are not in full use at the present time, and there will be relatively few of which this could be said, at week-ends at any rate. It is to be expected that, as most of the applications in connection with the C.A.G. scheme have been from young people who are weekly wage earners (*vide* Sir Francis Shelmerdine's broadcast talk), only a small percentage will be in a position to avail themselves of the cheap week-day rates of 5s. and 2s. 6d. The week-ends, on the other hand, will undoubtedly be crowded, and existing club machines will not go far towards meeting the demand for tuition.

That brings up the question of supply of aircraft. It must of necessity be several months before any suitable new types can be produced in large numbers. The decision of the Air Ministry to admit foreign aircraft, regrettable in principle and of doubtful assistance, may enable some schools to get going fairly quickly, but it would be well to bear in mind that because the Certificate of Airworthiness of a foreign aeroplane has been validated under a reciprocal agreement, it does not necessarily follow that the machine is suitable for *ab initio* training. One can think of quite a few which, while reasonably satisfactory for the experienced pilot, would be quite unsuited to primary training.

The same may well apply to some of the many new British types which will undoubtedly be produced as a result of the stimulus afforded by the new scheme. It would be unwise to pin too great hopes to an immediate supply of suitable training types, British or foreign.

Getting a Move On

THINGS are certainly moving. Of that there can be no slightest doubt. That most of them could have been set in motion long ago is a thought which will occur to many, but the readiness of the present Air Minister and the Under-Secretary to "implement" recommendations made during previous regimes is quite obvious, and once the ball has been set rolling it will gather momentum and finish up—goodness knows where. In a few months we may have thousands of pilots being trained at civil schools, or we may not. We may have an adequate Empire Air Base at Southampton, or we may not. We may have lots of high-performance commercial aircraft types, or we may not. We may be cleaving the stratosphere at 275 m.p.h., with the passengers sitting in a thermos flask, or we may not. We may even have given effect to the Gorell Report, or we may not. On the other hand, we may quite well be doing none of these things.

But anyway we have shown willingness by deciding that we will. The one thing about which the Air Ministry does not seem able to make up its mind is whether we want gyroplanes or not, helicopters or not, Focke-Wulfs or not. One would have thought this decision one of the easiest to make. Rotating-wing aircraft ought to have a strong appeal to Parliament. Of whatever type, they have wings which go round and round in circles and don't get anywhere in particular.

"I.T.P."

MOST welcome of all the decisions taken during the last few days is that announced by the Under-Secretary of State for Air in the House last week, when he stated that, in addition to the De Havilland all-metal monoplane (which, incidentally, he described as a four-engined type) which is to carry 12-17 passengers at over 200 m.p.h. and is now being built at Hatfield, an outline specification had been prepared in consultation with the operating companies for an all-metal four-engined monoplane weighing 40,000 lb. and capable of a cruising

"*Flight*" photograph.

C.A.G. PROTOTYPE : The open-cockpit version of the new D.H. Moth Minor, some preliminary details of which are given on page 97. Its form will be familiar to regular Hatfield visitors, since this and a cabin version has been in and out of the air for the past year. From its inception the D.H. 94 has been the special interest of Capt. Geoffrey de Havilland himself, and, with the Air Guard scheme in action, it will now have its chance.

speed of 200 m.p.h., carrying 20 passengers from London to Berlin non-stop. The long view was indicated by Capt. Balfour's reference to a general specification for a four-engined all-metal landplane of 70,000 lb. gross weight intended for high-speed long-range flights, one version to fly at 10,000 ft. and the other at 25,000 ft., the latter at 275 m.p.h. This is the first official intimation that work on pressure cabins is to be taken seriously.

The announcement must be welcomed for its proof of a desire in official circles to get going in real earnest, and it is good news indeed to learn that "instructions to proceed have already been placed by the Air Ministry for the production of prototypes of both versions."

Originally there was a tendency, among British designers, expressed during the discussion of Professor Younger's paper some months ago, to doubt the value of high-altitude flying and pressure cabins. We did not share that doubt, or rather we expressed the opinion that pressure cabins would be forced upon operating companies by the passengers' demand for cabins in which changes of altitude did not result in distressing pains in the ears. If we may be permitted to be slightly facetious about such a serious subject, we would say that although high-altitude aircraft may give the designers a pain in the neck, they will save the passengers a pain in the ear. Even if the Under-Secretary of State for Air should prove a little optimistic in his hope of "production by the summer of 1940," it is good news indeed to learn that something tangible is being done.

It is to be hoped that 70,000 lb. gross weight is not regarded by the Air Ministry as the limit in size. Other nations have drawn up plans for even larger aircraft.

Less Comprehensible

IF one can sincerely applaud the energy with which the question of suitable civil aircraft is being attacked by the Air Ministry, it is less easy to follow its reasons in the matter of the Empire Air Base on the South Coast. Last Thursday the Southampton Harbour Board announced, after its meeting, that Southampton Water was to be the permanent base for the Empire flying boat service, and next morning Capt. Balfour confirmed in the House that it had been decided to establish the base in Southampton Water. The stretch of sea (and mud) which is to form the take-off and alighting area is a mile long and 1,200 ft. wide, and is situated off Netley, *i.e.*, on the eastern side of the main channel. It is, in fact, approximately the area which has been used temporarily by the Empire flying boats, but will be dredged to make it usable at other than high tide.

Flight has on more than one occasion expressed doubts as to the suitability of Southampton Water. Its general direction is from north-west to south-east, while the prevailing winds are from south-west. In other words, the prevailing winds will blow across rather than along the selected stretch of water. It is to be expected that the large, heavily loaded flying boats of the future will need all of a mile run, and the intensity of shipping in Southampton Water is such that it may well interfere with the manœuvres of flying boats; and, of course, the other way about.

Another objection seems to be that with the slipways and sheds on the Hythe side of Southampton Water and the take-off area on the Netley side, machines will have

to taxi to and fro across the shipping lane. At times this may prove a real inconvenience to flying boats and shipping alike.

It has been stated that the Air Ministry will undertake the dredging of the area, the Southampton Harbour Board assisting in carrying out the launch service in connection with the base, and collecting landing dues from the flying boats. Thus, on the whole, Southampton seems to have struck a pretty good bargain. What makes the whole transaction a little difficult to understand is the fact that a week before the Southampton decision was announced Councillor Johnson, of Portsmouth, placed before the Air Minister a proposal for getting the Langstone Harbour scheme, without the barrage, going without cost to either the Air Ministry or to Portsmouth, the necessary capital being found privately.

There is much to be said for Langstone Harbour compared with Southampton Water. For one thing, the water is more sheltered, and the amount of shipping is negligible compared with that in Southampton Water. Furthermore, the Langstone scheme includes an aerodrome adjoining the flying-boat base. At Netley there is no room for an aerodrome, and flying-boat passengers and mails will have to be transported by rail from London as now, or by road from Eastleigh Aerodrome if they arrive by air. Finally, and most incredible of all, it is said that Imperial Airways were not consulted about the scheme. Yet, among other things, their new headquarters at Victoria will be rendered almost useless. A detailed explanation seems to be called for.

Pay of R.A.F. Officers

THE increases of pay for officers of the R.A.F. which have just been announced should not be considered by themselves but in conjunction with the increases also granted to the two older Services. Officers of the fighting Services in this country have always been underpaid, but of the three the grievances of the R.A.F. have been less than those of the two older Services. Now the cases of all three Services have been considered together, and the increases are designed to put all three on a comparable footing.

The new rates of R.A.F. pay will mainly benefit the officers with permanent commissions. Short-service officers will benefit to this extent, that promotion from Flying Officer to Flight Lieutenant will now take place automatically after two years' service in the lower rank provided that the officer is satisfactory. This means that at the end of his four years practically every short-service officer will go on to the Reserve as a Flight Lieutenant.

For the rest, the reforms deal with (a) scale of pay, (b) abolition of command pay, (c) grant of entertainment allowances to commanding officers of stations, (d) abolition of half pay, (e) retiring ages, and (f) retired pay and gratuities. The principle followed is to abolish grievances and those long waits for a rise which are apt to take the heart out of an officer. It must be remembered that in the R.A.F. promotion is mainly by selection, and it may happen that an officer who is quite a good man may be repeatedly passed over by men who are outstandingly good. This is apt to make a man feel sore, but as he now will get better rises in pay while still holding the same rank his sense of grievance will be lessened. Certainly the R.A.F. now offers an attractive career to permanent-commission officers.

Cheap Lift

THAT, owing to the greater relative air velocity, those parts of an aeroplane situated within the slipstream of the airscrews are subject to greater drag than parts outside the slipstream has been known since aircraft design was in its infancy. Curiously enough, no one has happened to realise that if a wing in the slipstream suffers greater drag it must also be capable of giving greater lift, or rather it had not occurred to anyone that things could be so arranged that the increase in lift could be made quite large and turned to good account, until the thought occurred to two Englishmen domiciled in America at the time.

Mr. Harold Bolas will be remembered by many of our older readers as chief designer to George Parnall, of Bristol, and Capt. Goodman Crouch was at one time in the Airworthiness Department at Farnborough. He also used to be handy with performance calculations and such, and actually began the system of handicapping which, after his departure to America, has since been carried out with such distinction by Messrs. Dancy and Rowarth. In America this idea of making use of the slipstream occurred to one or both of them, and they decided to examine the matter thoroughly. Wind-tunnel tests and flying trials with a curious biplane with two very large airscrews confirmed the suspicion that a very material increase in lift could be obtained by blowing the slipstream across the wing, particularly if it was pointed upwards slightly.

Mr. Bolas is still in America, where he continues the good work, but Capt. Goodman Crouch has returned to his native land, and is now preaching the gospel of the slipstream to British aircraft designers. In this issue we record some of the results obtained by these two Englishmen. The maximum lift coefficients which can be reached by a judicious arrangement of engines and airscrews are such as to make a study of the subject well worth while, and very nearly the full benefit of the slipstream can be obtained without need for freakish-looking design. The chief attraction of the slipstream scheme is that it does not supplant but actually increases the effectiveness of such high-lift devices as slots and flaps.

Prohibition

ALTHOUGH it is serious enough during the comparatively short period in which it is in force, the institution of the gargantuan prohibited area (described in *Notice to Airmen, No.* 164), which includes a large section of east and south-east England as well as the North Sea, is not, perhaps, as bad as our contributor on page 109 would have us believe. It is still possible for regular air services to fly, albeit by a tortuous route, to their Continental destinations; for private aeroplanes to cross to the Continent by a short sea route; and for essential internal air services to fly in pre-ordained channels.

The most serious sufferers will be those clubs and schools with their centres in the area. Their machines will be virtually grounded between 9 a.m. on August 5 and the same time on either August 7 or August 8, according to the way in which the Royal Air Force Exercises concerned are proceeding. We can see no reason why the schools should not be permitted to carry on, at least with circuit flying in good weather, and hope that, at least, the clubs and instructors will receive due compensation for loss of flying time. Even the Reserve schools can obtain no reprieve.

Another C.A.G. Problem

TO return for a moment to the Civil Air Guard, amidst all the excitement very few people appear to have considered the question of insurance—not of machines but of humanity. The majority of amateur pilots, largely because of the expense and bother of arranging the necessary cover, leave their future, dead or alive, in the hands of Providence.

It is probable, though, that many of those interested in the C.A.G. will, if only for domestic reasons, wish to have their present insurance and assurance policies extended to cover them against flying risks, since only a comparatively few will have the necessary financial background to take the risks involved. It might be suggested that the Government should take the matter in hand, but with the number of people concerned it may still be possible now for the big insurance companies to reduce their flying-risk premiums.

In the meantime, the insurance problem may cut down the number of prospective C.A.G. pilots by more than half, thus reducing the effectiveness of the scheme as a whole.

DIARY OF FORTHCOMING EVENTS—PAGE 102b

DEVON

Another Official Air... Low Cl...

"*Flight*" *photograph*

Zero hour on the clubhouse verandah: Sir Kingsley Wood declares the airport open. The Mayor of Exeter is on his right, with Mr. Straight. The Devon Air Race cup has nothing to do with the proceedings—other than in an ornamental capacity. No event was run this year.

JUST as flying meetings (excused by airport opening ceremonies) seem to be returning to something of their former status, meteorological conditions are doing their best to damp the renewed spark of public interest in such affairs. It rained at Luton, Ringway and Ipswich. Last Saturday, at Exeter, though no serious rain fell, the clouds were down at a few hundred feet during most of the afternoon and anybody who attempted to do anything dashing with an aeroplane was promptly engulfed in them.

However, the public rolled up (all ten thousand of them), most of the promised Service support got through, albeit with some difficulty, and the afternoon's performance continued without any serious breaks—which were, in any case, filled by an enthusiastically talkative commentator. Private owners and amateur pilots were, for the most part, deterred by the Air Ministry forecast. Very correct it was, too, but our own experience showed that, by dutiful attention to the contour map, and the work of railway engineers in days of long ago, it was possible to get through without any serious damage to the heart. It was one thing to bring a light aeroplane and quite another to lead a flight of Gauntlets—which also got through from North Weald after spending the night at Woodsford, near Dorchester.

Getting Through

With the conditions as they were, one felt particularly sorry for these No. 151 (F) Squadron pilots, who could do little more in their exhibition than dash about the sky in various exciting attitudes and altitudes. There simply wasn't room for more. The pilots of the Vildebeestes from Thorney Island, too, were unable to give their proper show, though they flew by in the bumps in two nicely packed flights before departing for home—flotation gear and all. The Lysander pilot from Old Sarum had no flotation gear, and shortly after his show and consequent departure he returned for the night, having met a large red cliff in the wrong place. On the following day, in similar conditions, he eventually chose the Taunton railway line, and overtook our own little aeroplane in a valley beside the Black Down Hills.

The flying programme actually started with fly-pasts by a Saro London from Mount Batten. Getting to Exeter at all was a good show, and the pilot, after flying about until his moment was due, eventually came by when the speeches (of which hereafter) were still in somewhat long-winded progress. Luckily, Pegasii are quiet beasts.

Followed a quick demonstration by various Straight aeroplanes and a tow-up in hopeless soaring conditions for Dr. Dewsbury with his Rhönsperber. This, all unseen and unrealised by the multitude, ended almost tragically. The Cadet accidentally towed the sailplane into some cloud, and the cable slacked so that, once again in the open air, Dr. Dewsbury more or less overlooked the tow-er's tail. Of course, the whole lot went tight again with a bang, very nearly pulling the nose off the sailplane and breaking the cable fitting off the Cadet. The cable, unreleasable in the circumstances, wrapped itself round the Rhönsperber, and Dr. Dewsbury put it down where and how he could in a ditchy field outside the leeward boundary of the airport. No damage was done, but so much for the gliding demonstration.

In the absence of Dipl. Ing. Emil Kropf, the exhibition of precise aerobatics was given by Herr Herwarth Wendel with his Bücker Jungmeister, and his own really characteristic display had to be washed out. No chance of upward rolls and inverted loops with the cloud base at 300ft. His opening circuit of continuous slow rolls was, however, beautiful to behold, and his flick rolls, as usual with this machine, gave those previously uneducated in Bücker manners the expected shock. "Flick" really is the word for them, and it is apparently possible to stop them dead in any attitude. Herr Wendel, who has only recently recovered from the results of a serious accident while flying inverted at ground level, treated the public to just one low-altitude inverted fly-past. He will be remembered by those who visited the York International last year. Technicians who wonder at the Bücker's spectacular take-off and climb will be happy to learn that the adjustable airscrew pitch is specially fined for each performance.

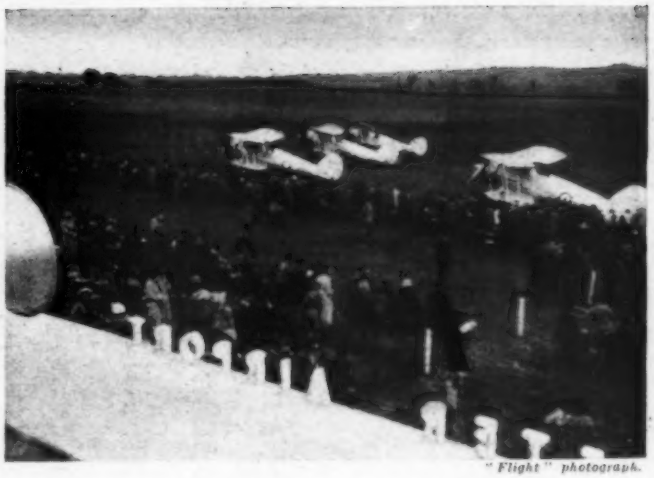
Capt. Symondson's show with his old Gipsy Moth was

"*Flight*" *photograph.*

The Saro London distracts attention from the ceremonial proceedings as it scrapes along below the cloud base to open the flying display.

ON AIR DAY

al Air ening — Exeter This Time : ow Cl ect the Display



"Flight" photograph.

The crowd in the official enclosure with a background of Gauntlets. The rest of the ten thousand are out of the picture to the right. Some idea of the conditions will be gathered from the fact that the clouds were sometimes touching the low hills seen in the distance.

probably, after this, not appreciated at its full worth by the populace, but it is a long time since we saw flick rolls done by a British pilot—and his were at a couple of hundred feet. Within the meteorological limitations his performance was magnificent. The Magister's aerobatic (and blind-flying) qualities were duly demonstrated, in similarly depressing circumstances, by Flt. Lt. Salter from the C.F.S. These machines, of course, are part of the standard equipment at Straight-operated schools. Flt. Lt. Salter's show was, like Mr. Wikner's, with the Cardiff Club's new Wicko, by way of being a gap-filler.

The Straight-manufactured gas-dragons (or elephants) appear to suffer seriously from excessive gross weight. That at Exeter, like the one at Ipswich, failed to rise properly for the big-game hunter in the Magister, and bowled dismally across the airport surface, on which it was almost safe from the attacker.

In due time the cloud base lifted a trifle, and Mr. Benno de Greeuw climbed into the Symondson Moth for his parachute drop from what looked like 7ooft., but we did not enter the height-guessing competition. All went well. Mr. de Greeuw was about the job of "killing" the canopy almost before he had touched. He really does know how to do it.

* * *

Exeter's airport has been in action for more than a year, and both Jersey Airways and Railway Air Services have now used it for a couple of seasons. The official ceremony, performed by Sir Kingsley Wood, can really be considered as applying to the club building (in now familiar Hening and Chitty "expandable" style) which was only finished a month ago.

The Secretary of State for Air was introduced by the Mayor of Exeter, Councillor R. J. Rew, who spoke of the city's special character, with neither industries nor military importance. He gave a brief history of the site. Mr. Whitney Straight spoke of the airport as being an ideal combination of public and private enterprise. He had not been over-optimistic of immediate possibilities in his airport plans, but had had pleasant surprises in recent weeks. One was the institution of the Civil Air Guard, and another was the promise of radio and meteorological facilities for Exeter.

Sir Kingsley, who was accompanied on this visit by Sir Francis Shelmerdine, the Director-General of Civil Aviation, reminded his hearers that Exeter was the first city to cut a canal for its shipping, and now, four hundred years later, was making provision for the new form of transport. He said that it was possible for the start of the C.A.G. scheme to be advanced from October 1 to September 1. Already 16,000 applications had been received by the Air Ministry, and they were still coming in. He praised the spirit and faith shown by the Straight Corporation.

He was thanked by the Sheriff of Exeter in a witty speech concerned mainly with the way in which the aerodrome was developed a little at a time ("Buy the land; nothing more. Well, we may as well level some of it—that won't cost much. . . ."), and by Ald. Mansfield, the chairman of the Estates Committee. The words "in spite of opposition" appear with unhappy regularity in the speeches at all such functions.

And, after all that, one must say a word concerning the way in which Sir Kingsley flies to these affairs. Exeter has no radio (yet), and his pilot had to bring the 86 in on a railway line and/or a coastline like everyone else. Perhaps the pilot should have special praise.

THE NEW MOTH MINOR

FOR two years the De Havilland Company has been engaged in the development and flight testing of a new type of light aeroplane for economical training and private ownership, to be called the Moth Minor. The announcement of this new machine was to have been made later in 1938, but, following the Civil Air Guard inauguration it has been decided to explain at once the Company's intentions to produce and market the machine early in 1939.

Some years of investigation of the problems of economical construction and operation has shown conclusively that economy must be achieved through two requirements:

(1) Simplicity in design, the avoidance of the use of special materials, and the adoption of a form of construction which, to the smallest detail parts, is capable of easy manufacture.

(2) The use of a robust and durable structure, which, coupled with a reliable power unit, will ensure ease of upkeep and low maintenance costs. Extreme ease of piloting and safe flying qualities are, of course, imperatively necessary and must be combined with a load capacity and a performance entirely adequate for cross-country travel in all weathers.

These fundamental conclusions, aimed at after considerable experience derived from the design, production and servicing of thousands of light aircraft during the past fifteen years, led to the decision to build a low-wing monoplane fitted with an engine developed, on smaller and simplified lines, from the Gipsy Major, and giving a maximum output of 90 h.p., so that there is plenty of power for take-off and climb. The company believes that the most sensible compromise has been achieved in the 1939 Moth. For over a year several experimental examples of the Moth Minor have been test-flying almost daily, and both machine and engine have now been systematically evolved to the stage when tooling for production on a necessarily large scale can be started.

The Moth Minor in its simplest form has two open cockpits in tandem and equipped with dual control, and can be flown solo from either cockpit without ballast. For solo flying the front cockpit is normally used because of the good view obtainable. The aeroplane is fully aerobatic with two up. The wings are provided with a simple folding arrangement for housing economy. The machine will also be available as a cabin tourer with a hinged coupé superstructure maintaining adequate headroom and general space with all the comfort of the cabin machine.

More detailed information will be issued in the near future, but it is interesting to learn that the first order has been accepted from the R.A.F. Flying Club.

PRIVATE FLYING

Topics of the Day

Still C.A.G.

NOW that the tumult and the shouting have to some extent died down in this matter of the Civil Air Guard, it might be as well to gather our collective wits and think of possible plans of concerted action.

Obviously, it would be wasteful, and perhaps even fatal, for the different clubs to go about things in their own way and to buy new machines and hire new instructors when and how they can manage to do so. Luckily, there is such a thing as the General Council of Associated Light Aeroplane Clubs, and it is presumably up to this weighty gathering to prepare the way.

Regretfully I plead guilty to a feeling of cynicism about the ultimate value of these Guardsmen and Guardswomen and to another, somewhat dog-in-the-mangerish, about all the worthy people who are now going to fly for next to nothing after thousands of amateurs (including myself) have had to spend large proportions of their earned and unearned incomes in obtaining the same facilities. Furthermore, as I said last week, I regret the passing of the days when there was some semblance of self-sufficiency in the business of private flying. However, that is by the way, and we can all be extremely glad of the effect of all this on the light aircraft market, which has recently been in the painful process of dwindling into nothing.

That the effect on this market will be considerable is already obvious. Two large firms which have been sitting on (or even experimenting with) very interesting designs for some considerable time will now be encouraged to go ahead with their productions. And, as I said before, what used to be known as the ultra-lightweight could only be expected to come into its own when large and reliable firms produced such machines. This they can now be expected to do.

Shades of Evening

EVEN now, however, these manufacturers (and other small but equally worthy ones) cannot be expected to lay down a batch of light aeroplanes unless they have some idea of the number that are likely to be bought. It seems to me that it is up to the clubs, through their Council or otherwise, to put their heads together and to obtain, once the majority of the enquiries have been received and sorted out, an idea of their separate requirements. They may then, even, place direct orders firmly around the trade.

The two manufacturers of which I am writing do not really hope to have machines coming out in reasonable quantities until next year, though others, in a smaller way, should be ready with suitable types in a month or two.

In the circumstances, this delay is not as serious as it may seem. Unless the scheme can be got under way within the next month (and it can't) we may just as well wait until next year. Not only is there the difficulty of supplying the demand for good and experienced instructors—and this is, perhaps, the most serious bottleneck of all, though seldom mentioned—but there can be no appreciable amount of evening flying after the end of September.

If everybody could be ready to start, using either British or foreign machines, in September, very few pupils would be able to take advantage of the scheme at the really cheap rates. How many of them can be expected to take a few hours off during the day? Even when it is light until, say, 7 p.m., aerodromes are usually so far away from the centres of daily labour, whether in office or factory, that only a very limited number would be ready to make use of the remaining hour or so of flying time.

Most of us have a little habit of imagining the future as being very like the present, and it is always hard to realise in August that in October, after the change from summer time on the second of that month, the sun sets at 5.30 p.m. —just the time when the majority of noses are being released from their grindstones.

Man-Power and Tricycles

FOR those clubs which have the organisation and the requisite number of instructors necessary to make a start towards the end of August (the earliest possible moment, anyway) there are still the American light aeroplanes. Quite a few of these will no doubt be bought, and it must be admitted that they are good and safe, and, even at their comparatively high price in this country, that they are very good value for the money. Nevertheless, and much as I like to see the agents concerned with such importations reap the benefit of their patience and propaganda during the lean years, there is no doubt that the clubs will always prefer to buy home-produced aeroplanes.

In spite of the amount of work going on in military preparations, it is quite absurd to say that civil aeroplanes cannot be produced in the necessary quantity. It is all a matter of organisation. The man-power is there, and these civil aeroplanes can, and will, be constructed of wood. All that the manufacturers needed was the hope of a market big enough to encourage them to consider such manufacture. War-time experience has shown that any amount of anything can be built (and be promptly blown up) if the demand and the cash are there.

One of the minor burning questions at the moment in some quarters is whether to produce conventional aeroplanes in the old style or to take the bull by the horns now and to use this magnificent opportunity for insinuating the tricycle undercarriage, with or without its pusher counterpart, on to the schools. The pusher is a logical layout both for training and for pleasure flying, and the tricycle type of undercarriage will undoubtedly take hours off the time spent in learning to fly.

In any case, the step from tricycling to conventional three-pointing is a comparatively small one once the pupil has become accustomed to judging heights and distances over a reasonably long period of practice. At present the pupil must take the stiffest fence right at the beginning of his training.

INDICATOR.

Private Flying

WHERE YOU MAY FLY

A C.A.G. Guide : The Clubs and Schools Now in Operation in This Country.

DURING the first few days after the initiation of the Civil Air Guard scheme it would probably have been almost an act of cruelty to the clubs to have published a list of addresses and thus have helped to increase the enormous number of enquiries being received minute by minute. Even now we wonder whether it is quite fair to include the telephone numbers.

This list may also help to ease pressure at the Air Ministry, which had, in a few days, to give "nearest club" names and addresses to some 16,000 enquirers.

The Secretary to the Commissioners, Air Commodore J. A. Chamier, hopes that the application forms will be ready to be distributed to the clubs by the middle of this month. These forms will then be sent to the applicants, who must return them and have the necessary medical certificate sent to the Air Ministry. When this has been attended to, the Ministry will give each accepted applicant a number, after which the clubs will be at liberty to start their training.

There will obviously be some delay before flying can begin, even at those clubs which are lucky enough to possess the required equipment and personnel, but these should at least be able to start work, if only in a small way, on or soon after September 1.

ABERDEEN.—NORTH BRITISH AERO CLUB, Aberdeen Airport, Dyce. (Tel. Dyce 32.)

BARNSTAPLE.—BARNSTAPLE AND NORTH DEVON FLYING CLUB, Heanton Court Aerodrome. (Tel. Braunton 121.)

BELFAST.—NORTH OF IRELAND AERO CLUB, Ards Airport, Newtownards, Co. Down. (Tel. Newtownards 190.)

BIRMINGHAM.—THE MIDLAND AERO CLUB, LTD., Castle Bromwich Aerodrome. (Tel. Castle Bromwich 2263-4.)

BLACKPOOL. — BLACKPOOL AND FYLDE AERO CLUB, The Airport, Stanley Park. (Tel. Blackpool 1121.)

BOURNEMOUTH. — BOURNEMOUTH FLYING CLUB, Bournemouth Airport, Christchurch. (Tel. Chri. 300.)

BRIGHTON.—SOUTH COAST FLYING CLUB, The Airport, Shoreham, Sussex. (Tel. Shoreham 585.)

BRISTOL.—BRISTOL AND WESSEX AEROPLANE CLUB, Ltd., Bristol Airport, Whitchurch. (Tel. Bristol 41165.)

CAMBRIDGE. — CAMBRIDGE AERO CLUB, LTD., Cambridge Aerodrome. (Tel. Feversham 331.)

CANTERBURY.—KENT FLYING CLUB, Canterbury Aerodrome, Bekesbourne, Kent. (Tel. Bridge 60.)

CARDIFF.—CARDIFF AEROPLANE CLUB, LTD., Cardiff Aerodrome, East Moors. (Tel. Cardiff 1894 & 2696.)

CARLISLE.—BORDER FLYING CLUB, LTD., Carlisle Airport. (Tel. Carlisle 1651.)

COVENTRY.—COVENTRY AEROPLANE CLUB, Whitley Aerodrome. (Tel. Coventry 588811.)

DONCASTER.—DONCASTER AERO CLUB, LTD., Doncaster Airport. (Tel. Doncaster 553431.)

EASTBOURNE.—EASTBOURNE FLYING CLUB, LTD., Wilmington Aerodrome, Sussex. (Tel. Alfriston 85.)

EDINBURGH.—EDINBURGH FLYING CLUB, LTD., 50, Melville St., Edinburgh. (Flying at Macmerry.) (Tel. Edin. 30196.)

ELY.—ELY AERO CLUB, City Chambers, Market St., Ely. (Flying at Ely and Caxton.) (Tel. Ely 228.)

***EXETER.**—EXETER AERO CLUB Exeter Airport, Devon. (Tel. Exeter 7142.)

FOLKESTONE.—CINQUE PORTS FLYING CLUB, Lympne Airport, Hythe, Kent. (Tel. Hythe 6171.)

GLASGOW.—SCOTTISH FLYING CLUB, LTD., Renfrew Airport, Renfrewshire. (Tel. Renfrew 191-192.)

GLOUCESTER.—COTSWOLD AERO CLUB, Glouc. and Cheltenham Airport, Cheltenham Road.

GRIMSBY.—LINCOLNSHIRE AERO CLUB, Waltham Aerodrome, Grimsby, Lincs.

HULL.—HULL AERO CLUB (1934), LTD., Bedford Chambers, Scale Lane, Hull. (Flying at Hedon.) (Tel. Hull 35686.)

***INVERNESS.**—INVERNESS AERO CLUB, LTD., Inverness Aerodrome. (Tel. Inverness 1242.)

***IPSWICH.**—IPSWICH AERO CLUB, Ipswich Airport. (Tel. Ipswich 7522.)

ISLE OF WIGHT.—ISLE OF WIGHT FLYING CLUB, LTD., Lea Airport, Sandown, I.O.W. (Tel. Sandown 270.)

LEEDS.—YORKSHIRE AEROPLANE CLUB, LTD., Leeds-Bradford Aerodrome, Yeadon. (Tel. Rawdon 134 & 165.)

LEAMINGTON.—LEAMINGTON, WARWICK AND DISTRICT AERO CLUB., Bishops Tachbrook.

LEICESTER.—THE COUNTY FLYING CLUB, LTD., 16, New St. (Flying at Rearsby.) (Tel. Leic. 22891.)

LEICESTERSHIRE AERO CLUB, LTD., The Airport, Braunstone. (Tel. Leicester 88456.)

LIVERPOOL.—LIVERPOOL AND DISTRICT AERO CLUB, Liverpool Airport, Speke (Tel. Garston 1229) and Hooton Park, Cheshire. (Tel. Hooton 149.)

LONDON.—AIRWORK SCHOOL OF FLYING, Heston Airport, Hounslow, Middx. (Tel. Hounslow 2345.)

BROOKLANDS FLYING CLUB, LTD., Brooklands Aerodrome, Weybridge, Surrey. (Tel. Byfleet 436-8.)

CIERVA AUTOGIRO CO., LTD., London Air Park, Feltham, Middx. (Tel. Feltham 2266-7.)

CIVIL AVIATION SERVICE CORPS, Maxwell House, Arundel St., Strand, W.C.2. (Flying at Cambridge.) (Tel. Temple Bar 7058.)

CIVIL SERVICE FLYING ASSOCIATION, LTD., 128, Green Lane, Edgware, Middx. (Flying at Maidstone.)

HERTS AND ESSEX AERO CLUB, LTD., Broxbourne Aerodrome, Nazeing, Essex. (Tel. Hoddesdon 2453.)

HOUSEHOLD BRIGADE FLYING CLUB, Heston Airport, Hounslow, Middx. (Tel. Hounslow 2345.)

INSURANCE FLYING CLUB, LTD., London Air Park, Feltham, Middx. (Tel. Feltham 2881-2.)

LONDON AEROPLANE CLUB, Hatfield Aerodrome, Herts. (Tel. Hatfield 2000.)

LONDON AIR PARK FLYING CLUB, LTD., London Air Park, Feltham, Middx. (Tel. Feltham 2881-2.)

MIDLAND BANK FLYING CLUB, Hanworth Aerodrome, Feltham, Middx. (Tel. Feltham 2881-2.)

OLD ETONIAN FLYING CLUB, Heston Airport, Hounslow, Middx. (Tel. Hounslow 2345.)

REDHILL FLYING CLUB, LTD., Redhill Aerodrome, Surrey. (Tel. Nutfield Ridge 2245.)

ROMFORD FLYING CLUB, LTD., Romford Aerodrome, Colchester Road, and Ilford Aerodrome. (Tel. Ingrebourne 2304.)

ROYAL AIR FORCE FLYING CLUB, Hatfield Aerodrome, Herts. (Tel. Hatfield 2315.)

ROYAL NAVAL FLYING CLUB, c/o Royal Aeronautical Society, 7, Albemarle St., London, W.1. (Tel. Regent 6800.)

SURREY FLYING SERVICES, LTD., Airport of London, Croydon, Surrey. (Tel. Croydon 3421.)

LUTON.—BEDFORD SCHOOL OF FLYING, LTD., Barton Airport, Beds. (Tel. Luton 2396.)

LUTON FLYING CLUB, Municipal Aerodrome, Luton. (Tel. Luton 3141.)

MAIDSTONE.—MALLING AERO CLUB, West Malling Aerodrome, Kent. (Tel. West Malling 222.)

MANCHESTER.—LANCASHIRE AERO CLUB, Avro Aerodrome, Woodford, Cheshire. (Tel Bramhall 404.)

NORTHERN AVIATION SCHOOL AND CLUB, LTD., Barton Airport, Manchester. (Tel. Trafford Park 2661.)

NEWCASTLE. — NEWCASTLE-UPON-TYNE AERO CLUB, LTD., The Airport, Woolsington, Kenton. (Tel. Kenton 69194.)

NORTHAMPTON. — NORTHAMPTONSHIRE AERO CLUB, Sywell Aerodrome, Northampton. (Tel. Moulton 233.)

EAST MIDLANDS FLYING CLUB, Ltd., Sywell Aerodrome, Northampton.

NORWICH.—NORFOLK AND NORWICH AERO CLUB, LTD., Municipal Airport, Norwich. (Tel. Norwich 2186.)

NOTTINGHAM.—NOTTINGHAM FLYING CLUB, LTD., Tollerton Aerodrome, Nottingham. (Tel. Plumtree 41.)

OXFORD.—WITNEY AND OXFORD AERO CLUB, LTD., Witney Aerodrome, Minster Lovell, Oxon. (Tel. Witney 170-234-263.)

PERTH.—STRATHTAY AERO CLUB, LTD., 1, Charlotte St., Perth. (Tel. Perth 349.) (Flying at Perth Aerodrome, Scone.)

***PLYMOUTH.**—PLYMOUTH AND DISTRICT AERO CLUB, Plymouth Airport, Roborough. (Tel. Crown Hill 71349.)

PORTSMOUTH.—PORTSMOUTH AERO CLUB, LTD., The City Airport, Portsmouth. (Tel. Portsmouth 2790.)

YAPTON AERO CLUB (see above).

***RAMSGATE.**—THANET AERO CLUB, Ramsgate Airport, Kent. (Tel. Ramsgate 928.)

READING.—READING AERO CLUB, LTD., The Aerodrome, Woodley, Berks. (Tel. Sonning 3148.)

SALISBURY.—WILTSHIRE SCHOOL OF FLYING, LTD., High Post Aerodrome, Middle Woodford, Salisbury. (Tel. Middle Woodford 23.)

ROYAL ARTILLERY FLYING CLUB, LTD. (see above).

SHEFFIELD.—SHEFFIELD AERO CLUB, LTD., Netherthorpe Aerodrome, Worksop. (Tel. Worksop 21638.)

SOUTHAMPTON.—AIR SERVICE TRAINING, LTD., Hamble Aerodrome. (Tel. Hamble 357-8.)

HAMPSHIRE AEROPLANE CLUB, Southampton Airport. (Tel. Eastleigh 87237.)

SOUTHEND.—SOUTHEND FLYING CLUB, LTD., Southend Aerodrome, Essex. (Tel. Rochford 56261.)

STOKE-ON-TRENT.—NORTH STAFFORDSHIRE AERO CLUB, Meir Aerodrome, Staffs.

WALSALL.—SOUTH STAFFS AERO CLUB, Walsall Aerodrome, Aldridge Road. (Tel. Aldridge 52202.)

***WESTON-SUPER-MARE.** — WESTON AERO CLUB, LTD., Weston Aerodrome. (Tel. Weston 2002.)

WORCESTER. — WORCESTERSHIRE FLYING SCHOOL, Tilesford Aerodrome, nr. Pershore. (Tel. Peopleton 2.)

YORK.—YORKSHIRE AVIATION SERVICES COUNTRY CLUB, Ltd., York Aerodrome. (Tel. York 3994.)

*Enquiries will also be dealt with at 17, Manchester Square, London, W.1. (Welbeck 7455.)

Private Flying

FROM the CLUBS and SCHOOLS

LONDON

THREE new members joined the London Aeroplane Club last week during which period the number of hours flown amounted to 140 hr. 45 min. Mr. R. Gillett has completed his "A" licence tests and Mr. E. A. J. Hillman made a night flight from Croydon to Lympne.

BOURNEMOUTH

Over 160 Air Guard applicants were dealt with in four days. Flying for last week totalled 34 hr., and Mr. E. Kilner took his "A."

READING

Great interest and keenness is being shown in the Civil Air Guard scheme. Five new members have now joined the club. Last week Mr. A. Wyllie achieved his first solo flight.

REDHILL

Last week club machines flew 88 hr. 55 min. Messrs. R. A. Harris and J. D. Greenhalgh have now completed their "B" licence night flights. Club machines were in demand for cross-Channel flights to Le Touquet and Holland. Six new members have joined the club.

MARSHALL'S

The total flying time for last week amounted to 60 hr. Mr. Howard has joined the club, while another member, Mr. Obeyesekere, carried out his first solo flight. Mr. Nabih completed his "B" licence night flight test, while other members went on cross-country flights to Worcester, Oxford, Birmingham and Heston.

YORKSHIRE

Flying for the week totalled 64 hr., the total for the month to date being 276 hr. Enlistment for the Civil Air Guard is progressing rapidly, over 500 applications having already been received. A number of charter trips were made during the week, both for the Press and private hire. Aerial photography increases in popularity.

BARTON (BEDS)

Over 150 people have signed preliminary membership forms for the Air Guard. The Club is arranging to start its C.A.G. operations on September 1 and has ordered two more aircraft and engaged two new instructors. Last week's club activities included a charter flight to Newcastle and successful participation in the Malling dawn patrol.

BENGAL

With the club's instructor away for a week and with one machine in for an overhaul it was only to be expected that the flying time for the month of June would drop to 50 hr. During the latter part of the month Capt. B. S. Leete, Technical Officer to the Directorate of Civil Aviation in India, and Mr. O'Brien, Chief Aircraft Inspector, paid the club an official visit.

BORDER

Flying times during the month ending July 29 totalled 103 hr., due largely to the tremendous number of people wanting joy rides. The club is going ahead with Air Guard arrangements and expects to be in a position to start the scheme by September 1.

HERTS AND ESSEX

The club is organising a goodwill tour of a number of French aerodromes between August 5 and 8. Two machines attended the West Malling Club's recent dawn patrol, the crew of four earning free breakfasts. Messrs. O. Donovan and Wright completed their "B" licence night flight tests last week. During the fortnight ending July 28 21.9 hr. were logged by the club.

HANWORTH

Some 800 Civil Air Guard applications have been received. Flying for the week ended July 30 totalled 107 hr. 50 min. Mr. Brian Goddard took his "A" licence. The club Leopard has been in constant demand recently, its flights including a charter trip to the Isle of Man. Members wishing to enter for the A.E.M. Challenge Trophy Competition are requested to forward their names to the secretary as soon as possible.

CINQUE PORTS

Flying hours for the week were 60. The club Leopard made two trips to Le Touquet during the week, and on Saturday, after the Folkestone Aero Trophy Race (reported elsewhere), Mr. David Llewellyn took Mr. Henry Horne and a party over to Le Touquet for a few hours in Mr. H. G. Thyne's Short Scion Junior, which had been competing in the race. Owing to pressure of work with the Civil Air Guard, for which there has been a terrific response from this part of Kent, and owing to the fact that the date of commencement of the scheme has been advanced to September 1, the club finds it is unable to organise the Cinque Ports Wakefield Cup Race, which was to have been held on September 3 this year.

NORFOLK AND NORWICH

From the number of enquiries received there can be no doubt whatever that the Air Guard scheme has created a great deal of interest in Norfolk. The club will, of course, make necessary arrangements for the formation of a section. Intending recruits can greatly assist by sending in their names immediately and thus enabling the club to get some accurate information on what the demand is likely to be. There was an increase in the amount of club flying during the week ended July 24 and on the Sunday morning three club aircraft took part in a formation flight during which they went from Norwich to King's Lynn and followed the coastline round to Yarmouth and so back to Norwich. During that week the Aerodrome was, for the first time, used for night landings. A temporary floodlight has been installed and with the aid of a flare path various types of civil machines have been taking off and landing during the hours of darkness.

The Tipsy Comes Out

THE first of the production two-seater Tipsy monoplanes has now been flying for some weeks. Quite recently it passed through Martlesham and now has a C. of A. in the normal category. The machine has been stressed for aerobatic work, and as soon as production is in full swing (and a tail parachute fitted) it will be taken out for the aerobatic version.

The final model has been considerably strengthened and cleaned up in detail, and more observant people may notice an increase both in dihedral and wash-out, as well as changes in the control surfaces, since the Belgian machine was first demonstrated over here.

General Aircraft's Contribution

A SHORT time ago General Aircraft took over the manufacturing rights for the C.W.A. Cygnet. This machine, in a somewhat modified form, is to be put into production immediately in order to meet the demand for training types for the C.A.G. The first production machine should be out in a few months.

The modifications to the original Cygnet are such that, except for the method of construction, which is on all-metal stressed-skin lines, and, therefore, of particular interest to the foreign market, it will be virtually a new type. It is well known that General Aircraft (and Mr. Hollis Williams, the chief engineer, in particular) believe firmly in the future of the tricycle type of undercarriage. Such an undercarriage, suitably faired, will be fitted to the Cygnet, and the tail will be redesigned and fitted with twin rudders. The reason for this last arrangement is largely to ensure absolute directional stability both on the ground and in the air, and with the throttle either closed or open. In other words, it is intended to be possible for the Cygnet, suitably trimmed, to be taken off on the throttle alone.

Another type on the G.A. stocks—and, in many ways, still more interesting—is a lightweight pusher for primary training. This machine will also have a tricycle undercarriage, and the entire layout has been conceived both for operational simplicity and manufacturing ease. It will be of the low-wing type and will be fitted with the new A.E. Pixie (erstwhile Weir) engine, a unit which is likely to be particularly suitable for pusher work, since a special fan cooling system was developed for it when used with the jump-start Autogiro.

No very definite idea can yet be given of the prices of these two machines, but the primary trainer will cost less than £500, and the Cygnet will be sold with complete blind-flying and night-flying equipment in normal form. It will be remembered that General Aircraft, with the S.T.25, were among the pioneers of the inclusive equipment idea.

Swallow and Cirrus

SINCE the demise of British Aircraft, a number of owners and clubs have been wondering where they could expect to find spares and maintenance facilities for their machines. Rollason Aircraft Services, at Hanworth, have taken over all the jigs and tools, and are carrying a stock of spares for Swallows.

Incidentally, Mr. P. de W. Avery, who was, until recently, on the Rollason sales staff, flew a V.E.F. J.12, on July 23, from Croydon to Riga, Latvia, non-stop, in one minute more than nine hours. The J.12, of course, has a Cirrus Minor engine, and for this flight (and, incidentally, for the I.O.M. races) the front cockpit was faired in, leaving a single little flexible glass "cupola" over the rear cockpit.

Quite recently another machine fitted with a Minor—a KZ-11, made by the Scandinavian Aero Industry—flew from Denmark to Tunis and back via Rome and Berlin. The machine carried one of the principals of the concern, Mr. Viggo Kramme, and was flown by Mr. Th. Petersen. The KZ-11 is a low-wing monoplane with an enclosed side-by-side two-seater cabin.

THE FOLKESTONE TROPHY RACE

Sun Favours Cinque Ports Meeting : H. Buckingham (Hornet Moth), Wins at 123.25 m.p.h.

LAST Saturday, while both the North and West of England bowed down to the onslaught of a complex system of eastward-bound depressions, Kent (and Folkestone in particular) revelled in brilliant sunshine. One would like to suggest that this was just one of the high spots of Mrs. Ann Davis' highly efficient organisation, arranged especially for the occasion of the Cinque Ports Flying Club's seventh annual Folkestone Aero Trophy Race. Anyway, from the spectator's viewpoint, conditions for the race were well-nigh perfect, but at least one competitor had something very rude to say about the bumps encountered on the 30-mile circuit.

For this race the Club had selected quite a sporting course, with four turning points. The first and longest leg was from Lympne to the Capel Airshed, which lies north-east of Folkestone. After a 270-deg. turn, a short leg was followed down to Folkestone Harbour, from which point the coast was followed direct to the Hythe Gas-holder, the third turning point. The next stretch, a short one, entailed a steady climb up from sea level to the aerodrome, on the eastern boundary of which was situated the fourth turning point.

Owing to the prevalence of quite a strong, gusty south-west wind, most of the competitors flew high on the Lympne-Capel leg and low on the coast-wise stretch, with the result that the spectators at Lympne had little or no warning of an approaching competitor as he zoomed up from Hythe to take the Lympne turn—all of which considerably added to the excitement of the racing from the onlooker's viewpoint. Even Mr. Dick Bentley, situated high up on the hangar roof, found it difficult to spot an approaching machine—a point which did not in the least detract from his achievements as a first-class commentator throughout the afternoon. Shortly after mid-day the eight competitors in the first heat lined up across the northern boundary of the aerodrome. The aircraft varied from the little Chilton flown by Miss Mona Friedlander to Alex. Henshaw's famous Mew Gull. Messrs. Dancy and Rowarth seemed to have found one or two things that involved work on the handicapping sheet, but by 12.30 p.m. all was set and the limit machine, the Chilton, set off on what was to be an exceedingly bumpy passage for the pilot.

Excitement was intense at the end of the third and last lap. The commentator announced that he could see three machines coming up from Hythe and almost before the words were out of the loudspeaker's mouth Du Port's Tiger, Morris' Hobo and De Havilland's T.K.2 appeared over the trees. The Hobo passed the Tiger before the aerodrome boundary and crossed the line a bare 100 yards in front, while close on the heels—or elevators—of the Tiger came the T.K.2. All three machines were inside the aerodrome at the same moment, which speaks highly for the handicapping. Actually only eleven secs. separated the first and third. Less than a minute and a half later Humble streaked over the line into fourth place.

The second heat took place after lunch and was by comparison with the first heat somewhat uneventful. The limit man was R. V. Porteous, flying a Chilton, while scratch was F/O. David Llewellyn on an unfamiliar mount—the red Mew Gull G-AEKL, which Guthrie had brought into second place in the King's Cup. Llewellyn was flying under an additional handicap, for two days previously he had been trying out the Mew Gull when, over Southampton at approximately 3,000ft., the cowling over the cockpit became detached and damaged the tail. In the ensuing fun and games, Llewellyn experienced a black-out and damaged both elbows. Incidentally, he had pulled out just in the nick of time at a bare 200ft.

By the end of the third and last lap, H. Buckingham in the "demonstrator" D.H. Hornet, came home an easy winner from Samuelson's Comper Swift, Tommy Rose being unable to better third place. Fourth was H. J. Wilson in the Vega Gull.

The first four in each heat were in the final. Lap 1 saw the Tiger well ahead of the Hornet. Samuelson, with his Comper, and Morris, in the Hobo, both executed neat and well-judged turns, climbing slightly to take advantage of the wind. As befitted their speed, both Geoffrey de Havilland and Tommy Rose, in the T.K.2 and Speed Hawk respectively, took the turn in a steady, wide vertical bank.

During the second lap the Hornet appeared to pull something out of the bag, for it not only gained on the Swift, but closed up on the Tiger. Behind them lay Morris in the Hobo, who seemed to be losing, if anything, on his handicap (it afterwards transpired that his revs wore down by nearly 100 r.p.m.). In the rear the back-markers—Tommy Rose and De Havilland—were coming up in grand style, although their chances at this stage seemed, to say the least of it, remote.

During the third lap an expectant hush fell over the spectators as they awaited the first indication of the finish. Over the loud-speakers came the announcement that a biplane was approaching. Was it the Tiger or the Hornet? The commentator said he *thought* it was the Tiger. But he was wrong; for it was Buckingham's Hornet that first came over the trees to cross the line as the winner. Behind him came Samuelson in his red Swift, followed by De Havilland in the T.K.2 and Du Port with his Tiger Moth.

H. Buckingham, as winner of the Folkestone Aero Trophy with his Hornet Moth, also received a cheque for £50, presented by Col. and Mrs. R. H. R. Parminter, Mr. J. A. M. Du Port and Mr. Fred Sigrist. A silver medal and £25, presented by Sir Philip Sassoon, Bt., was awarded to Mr. G. Samuelson, who was placed second with his Comper Swift. The third man, Geoffrey De Havilland, was awarded a silver medal with a cheque for £10, presented by Mr Noel Coward.

"Flight" photograph.

Mr. Buckingham receives the trophy from Mrs. Ann Davis. On the right, applauding, is F/O. David Llewellyn, who flew a Mew Gull.

FINAL

Entrant	Pilot	Aircraft	Start	Finish	Nett Time	Place	Average Speed
			min. s.	min. s.	min. s.		m.p.h.
J. A. M. Du Port ...	J. A. M. Du Port...	Tiger	0 00	32 58	32 58	4th	107.50
H. Buckingham ...	H. Buckingham ...	Hornet ...	3 17	32 03	28 46	1st	123.25
G. Samuelson	G. Samuelson ...	Comper ...	3 46	32 30	28 44	2nd	123.25
Mrs. Ann Davis ...	A. J. S. Morris ...	Hobo ...	4 55	33 47	28 52	8th	122.75
C. Napier	H. J. Wilson ...	Vega Gull ...	8 22	33 34	25 12	7th	140.50
W. Humble	W. Humble ...	Sparrowhawk	11 43	33 00	21 17	5th	166.50
Lord Wakefield ...	G. De Havilland ...	T.K.2... ...	12 54	32 37	19 43	3rd	179.50
L. Fontes...	Tommy Rose ...	Hawk ...	13 33	33 11	19 38	6th	180.25

CORRESPONDENCE

The Editor does not hold himself responsible for the views expressed by correspondents. The names and addresses of the writers, not necessarily for publication, must in all cases accompany letters.

THE CIVIL AIR GUARD
An Aircraft Constructor's Views

SIR KINGSLEY WOOD'S truly statesmanlike action in touching the imagination of the public has met with its natural response—many thousands already clamouring to avail themselves of a great opportunity.

This great scheme does not mean only that many thousands will actually fly; it means the stimulating of the inventive faculties and many other such important points which at first are overlooked; one in particular is that familiarity with the use of aircraft by a large number of young, technically minded people in this country will inevitably provide the supply of practical knowledge and experience of which the aircraft industry is experiencing such a shortage at the present time.

There are signs that those who find themselves temporarily overwhelmed by the demand to learn to fly are afraid that the British aircraft industry cannot meet the need which will later arise for machines. One already hears suggestions that foreign aircraft should be imported for this purpose.

As a manufacturer, I cannot state too emphatically that the British aircraft industry can meet the need for machines when it really arises. It is not true, and never has been true, that the manufacturer of civil aircraft is so preoccupied with military work that he cannot take on the manufacture of civil aircraft. The truth is that until Sir Kingsley Wood took this bold and imaginative step there was no demand for civil aircraft, and so for the moment their production is negligible.

There are in this country to-day many thousands of skilled workers in allied trades unemployed, and these men alone could produce all the civil aircraft which we need, and they could produce them in time to meet the real need of this new scheme.

Thus, in a very short time, that essential basis for export—*i.e.*, a good home market—would be provided, and in the near future we should again see British civil aircraft active in the markets of the world.

The fact is overlooked that it will take many months to organise the present equipment so that it may be used effectively (which is not the case at present; there are few machines being used for more than 25 per cent. of their possible capacity to-day), train the necessary instructors and take those essential steps in preliminary organisation which need to be taken.

My own company and other civil aircraft manufacturers (I am bold enough to speak for others) can have the necessary aircraft ready by the time these preliminary steps have been taken. But if, in a panic, we are to have foreign aircraft imported in advance of real requirements, then damage will be done which will be largely irreparable to the creation of an additional reserve of technical men and to an opportunity for the reduction of unemployment.

E. C. GORDON ENGLAND,
Managing Director,
General Aircraft, Ltd.

Hanworth.

SAILPLANE BLIND-FLYING
—and the Link Trainer

MR. PHILIP WILLS, the well-known glider pilot, in his interesting article on "Sailplane Cloud Flying," in your issue of July 14, infers that the Link Trainer would be useless for training glider pilots for cloud flying because it cannot induce the feeling of vertigo experienced in actual gliding in clouds.

I am not a glider pilot, so I cannot argue with him, but I would suggest he tries the Link Trainer to ascertain whether his inference is correct.

I can tell him that quite experienced pilots do obtain a feeling of vertigo when spinning in the Link Trainer; the realism of the effect on more than one individual has been so drastic as to cause them to smash up the controls in their endeavour to come out before hitting the ground.

Without any experience of gliding, I should judge that the Link Trainer is the ideal method of preparing oneself for an attempt on Wills' height record.

P. F. M. FELLOWES,
Air Commodore (retired).

London, W.1.

CLOUD-BASE HEIGHT at a GLANCE

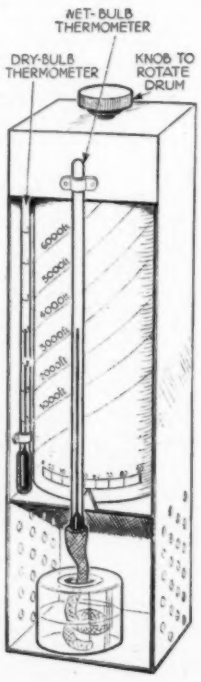
THE desirability of a simple instrument for measuring immediate cloud-base height, to supplant the present rather elaborate methods, is obvious. Thus there is unusual interest in a neat little device which we found hanging modestly alongside a back door of the London Gliding Club's establishment at Dunstable during the National Gliding Contests.

Enquiries elicited the fact that it was the invention of Mr. J. S. Fox, who is a sailplane pilot of very considerable experience (he has held a number of records, including a share in the then world's two-seater record of 10 hours with Flt. Lt. Murray in Germany last year; a British distance record of 145 miles; and best individual flight—96 miles to a declared goal—at the recent Contests). It was Mr. Fox's interest in meteorology which led him to take up gliding seriously in 1934.

The beauty of his "cloud-base recorder" lies in its absolute simplicity; it is obviously as foolproof as any scientific instrument could possibly be.

Three years ago the inventor made his first real "thermal" flight in a sailplane. This flight was started under a clear blue sky, but when it had reached a height of about 4,000ft., wisps of cloud started condensing all round the sailplane as it soared on upwards. The pilot began to wonder why this phenomenom should occur at 4,000ft., instead of at, say, 3,000ft., or at any other height.

The air in the thermal, he reasoned, had obviously come up with the sailplane from the ground. It therefore seemed possible that, by testing the condition and humidity of the air at ground level, one might be able to calculate how high such air would have to rise in order to cool sufficiently for cloud-condensation to take place. This idea he first worked out theoretically for every possible type of day, and the last two years have been spent in making as many practical tests as possible during actual soaring flights.



The Fox cloud-base recorder.

The instrument consists fundamentally of an ordinary wet-bulb and dry-bulb hygrometer, for measuring the humidity of the air before it starts upward on its cloud-forming journey. The *modus operandi* is simplicity itself. One reads the ordinary temperature on the dry-bulb thermometer, seen on the left-hand side of the sketch. If this is, say, 60 deg., one rotates the central drum until the pointer at its foot comes in line with the corresponding 60 deg. mark on the scale behind it. The height of cloud-base is then read off from the height of the mercury in the central (wet-bulb) thermometer against the diagonal lines on the drum.

It was originally imagined that the instrument would be serviceable only on such days as were good for the soaring pilot, *i.e.*, those with strong up-currents; but subsequent experiments, it is stated, have proved that it is also reasonably reliable on almost every kind of day. The assumption is, therefore, that all low cloud is formed by rising air, even though this air may ascend far too slowly to be noticeable even in a light sailplane.

At Dunstable, as quite a number of people could witness, the instrument gave surprising results. Not only did it register accurately, to within a hundred feet or so, the actual height at which low cloud was encountered by the aeroplanes and sailplanes which were flying at the time, but also, on one day when the clouds suddenly lifted from about 1,800ft. to 3,000ft., this uncanny little device accurately prophesied this change, going up from one reading to the higher one within a matter of only ten minutes or so.

We understand that it is protected by a provisional patent, and that it is soon to be marketed by Negretti and Zambra, 38, Holborn Viaduct, London, E.C.1.

"Flight" photographs.

Some instructors and members of C.U.A.S. Wing Cdr. Lockyer, the Chief Instructor, is in the centre and on his left is the Chief Flying Instructor, Sqn. Ldr. N. W. F. Mason, bending forward.

THE C.U.A.S. at ABINGDON

THE Cambridge University Air Squadron has again invaded Oxford territory by spending its attachment at Abingdon station. There the instructors have lived in quarters, and the members have slept in bell tents, though they used the station officers' mess in the daytime. The attachment started on June 20 and ended on July 29. As usual, one-third of the members came up at a time for a fortnight at Abingdon. The establishment strength of the squadron remains at seventy-five, but supernumerary members are allowed, most of them undergraduates who intend to apply for permanent commissions in the R.A.F. but are not regular members of the squadron. So during the six weeks eighty-three members attended the attachment, and over 2,000 flying hours were put in before the six weeks came to an end.

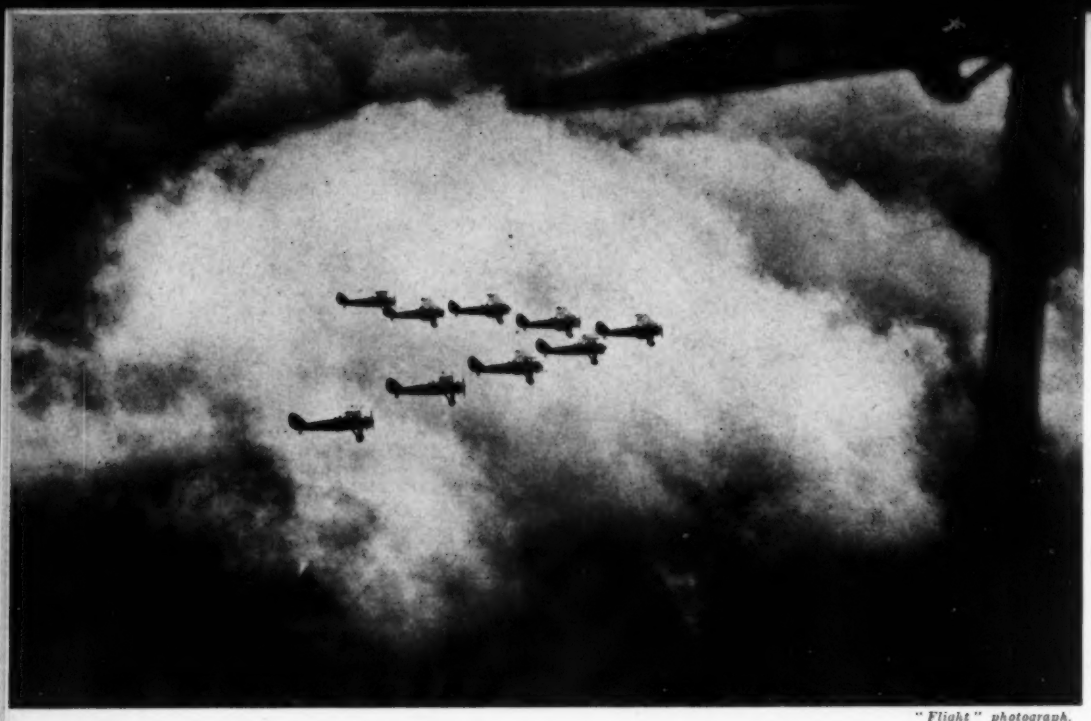
Whereas some time ago it was considered rather naughty to talk about defending one's country, now everybody is only too anxious to see the air power of Britain increased, and so the C.U.A.S. is rightly proud of the fact that thirty of the present members have been commissioned in the R.A.F. Volunteer Reserve, and that another thirty were applying for commissions. Seven are also applying for permanent commissions; one for a short-service commission, and two for commissions in the Auxiliary Air Force. That is a very fine record.

During the attachment there has also been some practice in camera gun work. The ground range at Abingdon is no longer used, as firing from air to ground is no longer considered to be useful training. All the camera gun work has been air-to-air firing, the sort of work which has to be undertaken by a fighter when attacking a raiding bomber. Of great use to both military and civil pilots is instrument flying, and to this the C.U.A.S. has given special attention. Owing to the needs of Service pilots, not much work was possible with the Link trainer.

Flying training is carried out by the Duxford Station Flight, under Sqn. Ldr. N. W. F. Mason, which was strengthened during the attachment by the loan of two sergeant pilot instructors. The normal equipment of the squadron is Tutors, but for the attachment it was given some advanced types, namely, Hinds and Audaxes. A num-

"Flight" photograph.

The Link Trainer at Abingdon was used whenever it was available, which was not very often.



"Flight" photograph.

Very pretty formation: The leading Cadet was flown by one of the instructors, but all the other eight were piloted by members of the squadron.

ber of cross-country flights in formation were carried out at week-ends, and visits were made to Scotland and Northern Ireland. Weather, however, prevented two formations of Tutors from reaching Aldergrove. Less experienced pilots made the round flight Bircham Newton-Martlesham-Hawkinge-Tangmere-Abingdon. Two members had to make forced landings, which were both successfully carried out. One Audax with a faulty carburetter was very cleverly put down over some trees into a small field by a pilot who is also a member of the Cambridge Gliding Club.

There are actually seven members of the Cambridge Gliding Club in the squadron, and they are all good pilots. That club made quite a name for itself at the recent gliding meeting at Dunstable. The Chief Instructor, Wing Cdr. C. E. W. Lockyer, highly approves of gliding as an auxiliary to power flying. One glider pilot went solo on a Cadet on his second day of instruction.

Though Cecil Rhodes had nothing to do with Cambridge, that University has quite a strong connection with the Dominions, and the C.U.A.S. includes two Canadians, two Australians, one New Zealander and nine South Africans.

No fewer than thirty-five members are leaving the squadron this year, but there will not be the least difficulty in filling the vacancies with men just as good as those who have gone out to fly in the big open spaces of the world.

"MUDDLING" in AUSTRALIA

Some Caustic Comments

"HAMPERED at every step since the early days by the short-sighted and muddling control of the Defence Department, civil aviation in Australia is now in greater need of divorce from such supervision than at any other time in its history. With the institution of the Empire flying-boat service and internal development at an advanced stage, it is now too important a branch of the public service to be juggled about by politicians possessing little knowledge of its importance or potentialities." So writes an Australian correspondent, whose views arrived after the Darwin affair.

For long the public and airline operators have suffered, he goes on to say, from the pig-headedness of the Defence Department, and the last straw is seen in the extraordinary muddle in which the Defence Department has left the Australian end of the Empire flying-boat service. Although the Department has known for months that the base would have to be constructed, Rose Bay, the Sydney terminal, will not be completed until September. At the moment it is but a primitive mixture of huts, galvanised iron and concrete, and has no repair facilities. Until it is finished, passengers from Europe by flying-boats will be able to contrast the higgledy-piggledy of the base with the new Singapore airport, and Australians will be able to console themselves with Mr. Thorby's assurance that "ground organisation has reached a sufficiently advanced stage." Also, Australians must continue paying 5d., the highest air mail rate in the Empire, to write to England.

Then, too, no concrete plan of distributing the mails when once they reach Australia has yet been formulated. Simultaneous delivery, utilising the inter-capital air services, would almost certainly require night flying—and Australian airports have not got the necessary equipment. At Essendon, the airport of Melbourne, for instance, the ultra-short-wave transmitter has been installed for over a year and is not yet in operation.

But it is not only in the air mail business that the Defence Department is showing its ignorance of civil aviation matters and remedies. It is hopelessly out of touch with the rest of the world in developing airports and air routes. For instance, not one major terminal in Australia has modern facilities for the public. Sydney and Melbourne airports, even, are still primitive in many respects. The only visible modern conveniences specially provided for passengers have been the thought of the private companies. Most of the country airports are hasty structures of rusty petrol tins, their surfaces pitted and covered with stones and mounds. No insurance company in Australia will grant policies to airlines for damages received to their machines on provincial landing grounds. Several of these aerodromes are not even fenced off and pilots have to "shoot up" the stock into a corner of the field before they can land. Even the maps issued by the Defence Department are inadequate for the needs of pilots and, in several instances lately, have been proved inaccurate.

"Never at any time," concludes the writer, "has the Department mapped out a concrete plan of progress. It has blundered on and on. Everything which has been done to bring civil aviation to modern standards has been done by private airlines in the face of opposition from the Defence Ministers of the day. The sooner civil aviation is divorced from its control the better it will be."

Forthcoming Events

August 20. Eastbourne Flying Club: Garden Party and Opening of New Club-house.

August 27-28. Southend Flying Club: Flying Meeting and Race.

September 3. Cinque Ports Wakefield Cup Race, Lympne.

September 10. Cardiff Aeroplane Club: London-Cardiff Race.

September 11-18. Swedish Civil Aviation Week.

September 21. Aero Golfing Society: Cellon Trophy, Richmond Golf Club.

November 18-December 4. Paris Aero Show.

HERE and THERE

Records : "P.B.'s" Latest : Soaring Honour for P. A. Wills : Unconventionalities from the States

More Light Plane Records

FOLLOWING its records established recently over 100 km. the Arado Ar.79 has now made records over 1,000 km. The same machine was used and Lüber was the pilot. With a passenger the distance was covered in 4 hr. 34 min. 15 sec., giving the impressive mean speed of 218.778 km/hr. (135.94 m.p.h.). This was the first record to be established in Class C, Category 3 (2 to 4 litres), and the flight has yet to be homologated. The route was from Bremen to a turning point 501 km. away at Schwessin, near Köslin, in Pomerania, and back, and the flight was made at a height of about 100 metres in unfavourable weather and with the Hirth engine at full throttle.

On July 15 Lüber made another attempt on the 1,000 km. record, this time flying solo. The course was a short one of 50 km. near Brandenburg, and in spite of the number of turns that had to be made he succeeded in averaging 229.397 km. (142.54 m.p.h.)., covering the 1,000 km. in 4 hr. 21 min. 58 sec.

Camera Ingenuity

A YEAR or two ago that inveterate inventor of aeronautical and other gadgets, Mr. Noel Pemberton-Billing, dropped into *Flight's* offices with his latest brain-child—an incredibly miniature miniature camera.

For some time now the production version of that camera has been on the market under the name of "Compass," and we recently had an opportunity of examining one. The makers feel that its extraordinary compactness and its lightness—it measures only 2¼in. × 2⅛in. × 1⅛in. and weighs 8 oz.—will appeal to flying people.

It is literally a "vest-pocket" camera, the bulk which it occupies being roughly equivalent to that of a "20" cigarette packet. Into this tiny space the ingenuity of Mr. Pemberton-Billing and the skill of a Swiss watch-making factory (which manufactures the instrument for the licensees, Compass Cameras, Ltd.) have condensed a quite incredible number of components and accessories. To name only a few, there are an F 3.5 lens, shutter giving speeds of from 1/500 sec. to 4½ sec., coupled range-finder, three built-in filters (instantly changed by turning a milled wheel), and a built-in extinction-type exposure meter. Yet everything appears sturdy, and the finish and workmanship are superb.

The Compass camera takes special miniature plates (1⅛in. × 1in.) or, at an extra cost for the necessary back attachment, a six-exposure film. At first sight the little instrument might intimidate the photographic novice, but actually its operation is simple, and those who doubt its picture-making capabilities should go along and see examples at the showroom of Compass Cameras, Ltd., 57, Berners Street, London, W.1. Needless, to say, the instrument hardly comes within the "cheap" category; its price is £30

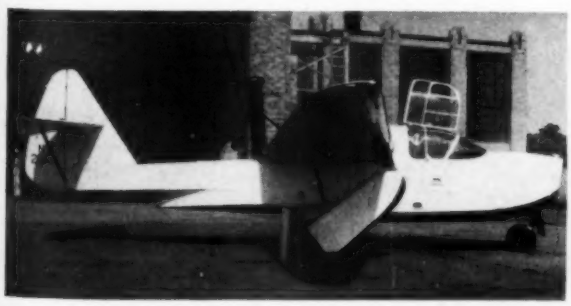
"Flight" photograph.

MAJOR D. CLOETE, M.C., A.F.C., Director of Aviation in the Government of Southern Rhodesia, with the D.H.89 which he is flying out to Africa. At a ceremony at Hatfield recently, Mrs. Lanigan-O'Keefe, wife of the South Rhodesian High Commissioner in London, named the machine *Southern Rhodesia*. Used on administrative duties, it will save officials many long and tedious journeys. Maj. Cloete, who was flying in 1914-1918, and was a C.F.S. pilot, will pilot the D.H.89 on many of these trips.

Fuel Systems—A French Review

DOCTOR BASILE DEMTCHENKO, PH.D., in *A.M. Fuel Systems for Aircraft*, a thousand copies of which have been printed in English by Gauthier-Villars, 55, Quai des Grands-Augustins, Paris, presents a comprehensive review of typical systems and includes a great deal of useful theoretical matter. The book has an introduction by M. Paul Dumanois, Inspector-General of Aeronautical Research and Instruction at the French Air Ministry, who says: "When a manufacturer is willing to adopt an impersonal, technical point of view and put at the disposal of the public the results of his long experience I feel that such true co-operation deserves to be encouraged." His encouragement has certainly not been misplaced, for the new work is far from a catalogue, but rather a useful text-book by a recognised authority and one which should be of considerable benefit to aircraft and engine designers.

Copies can be obtained in this country from David Nutt (A. G. Berry), 212, Shaftesbury Avenue, London, W.C.1; H. K. Lewis, 136, Gower Street, London, W.C.1; and Muller, 26, Hart Street, Bloomsbury, London, W.C.1.



AMPHIBIOUS UNORTHODOXY: The Spencer-Larsen S.L.-12C, which has a four-cylinder Menasco in the hull driving a pusher propeller through gear transmission. Two main wheels of the tricycle undercarriage are mounted in the tails of the floats and retract with the floats. Construction is mainly of wood. Data are: span, 40ft.; wing area, 164 sq. ft.; weight empty, 1,600 lb.; and gross weight, 2,200 lb.

HERE and THERE (CONTINUED)

A TWIN-ENGINED ALTAIR : Yes, really. The power plant (as may be seen in the photograph on the right) consists of two inverted Menascos geared to one airscrew. Either engine may be taken out of gear if trouble occurs. The machine has been constructed by the Vega Airplane Company, a Lockheed subsidiary.

Guide to Ground Engineers

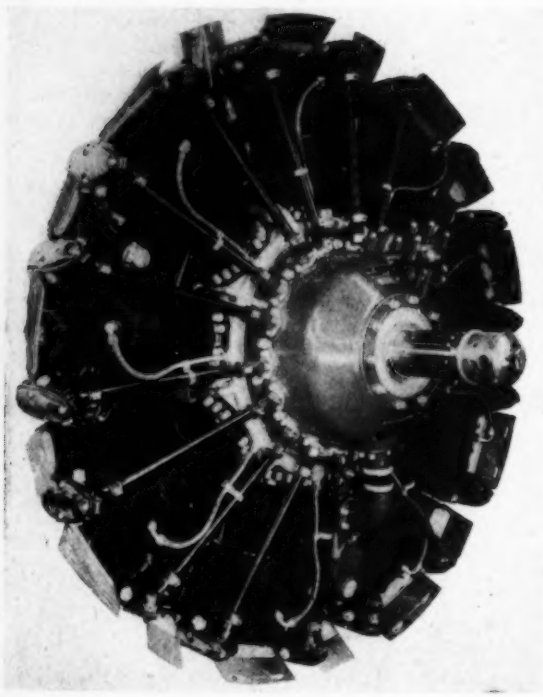
THE second volume of the Air Ministry's *Airworthiness Handbook for Civil Aircraft* has now been published. This deals exhaustively with inspection—the first one covered design—and is obtainable from H.M. Stationery Office, at 7s. 6d. It is in robust loose-leaf form so that the steady flow of necessary amendments may be satisfactorily incorporated as they come along month by month.

Soaring Award for Mr. Philip Wills

THE Gold Badge for soaring flight, for which flights of 300 km. (186.4 miles) distance and 3,000m. (9,847.5ft.) altitude must be made, has been awarded to Mr. Philip A. Wills by the International Commission for the Study of Motorless Flight. Mr. Wills fulfilled the conditions by taking his Minimoa sailplane 209 miles from Heston to St. Austell on April 30, and to a height of 10,080 feet from Dunstable Downs on June 5 this year. He receives No. 3 in the international series, No. 1 having gone to Heini Dittmar, the German pilot who won the international soaring contest at the Wasserkuppe last year.

When the Germans began to develop gliding after the Great War there was only one type of gliding certificate, which they bestowed on anybody who could do a straight glide of 30 seconds duration. The present C certificate, given for a soaring flight of over 5 minutes without loss of height, was instituted in 1923, and the Silver C in 1931. Mr. Wills was the second British pilot to receive the Silver C, for which soaring flights of 50 km. distance, 1,000m. climb and 5 hours duration have to be made. He was awarded No. 45 in 1934. There are now 845 Silver C pilots in the world, including 30 British, while C certificates number tens of thousands and A badges run into six figures.

How long will the new Gold Badge remain the highest award obtainable by sailplane pilots, and what new feats of wizardry will be required of them when the time comes to replace it by a platinum or diamond medal?



THE MOST POWERFUL "NINE"? : The Wright G.100 Cyclone, which gives 1,100 h.p. for take-off and which powers the new Douglas D.C.3s (illustrated last week) ordered by K.L.M. This model may be equipped with a two-speed supercharger.

For Plug Testing

A NEW sparking plug testing equipment, which, though primarily made for motor engineering use, is claimed to be equally suitable for aero engine work, has been produced by Runbaken Electrical Products.

The "True-test" system is ingenious, providing as it does a visual reproduction of the spark of the plug under test. It is stated that oscillations picked up at the plug terminal charge a condenser of carefully predetermined capacity. The condenser, an inductance coil and a spark gap, are in series-parallel connection and so balanced as to pick up the precise resonance of the oscillations across the spark gap.

To discharge, the impulses have two alternative routes; (a) across the spark gap in a sealed glass discharge tube; (b) across the wound inductance. If the current is of the correct frequency the first path is taken, and the correctly firing plug is indicated to the observer looking through the eye-piece as a continuous brilliant stream of sparks across the gap. If, for any reason, the plug is not functioning properly, the correct frequency conditions no longer exist, and the discharge passes by way of the inductance in preference to crossing the spark gap; it thus becomes visually non-existent, or, in other words, indicates a "miss."

A descriptive folder is obtainable on application to Runbaken Electrical Products, 13-15, Liverpool Road, Deansgate, Manchester 3.

SITTING on the SLIPSTREAM

Effective Lift Coefficient of Five Obtained With the Crouch - Bolas Engine Arrangement

AMAZING progress has been made with high-lift devices of different sorts during the last few years. Slots, slotted flaps, split flaps, rider planes and so forth raised the maximum lift coefficient from the 0.6 or so (in the old-fashioned British "absolute" units) of the thin, moderately cambered biplane sections in common use before the revival of the monoplane fashion to 1.5 or more when applied to the modern cantilever wing.

Obviously the increased unit lift can be used either to reduce landing speed for a given wing loading or for keeping the landing speed the same and increasing the wing loading, thereby obtaining an improvement in maximum and cruising speeds. The tendency has, rather naturally, been towards the latter course. Not only so, but the ability to steepen the gliding path by the use of flaps has made it possible to employ even greater landing speeds and trust to the new technique and greater skill of the pilot to make landings safe at the greater speeds.

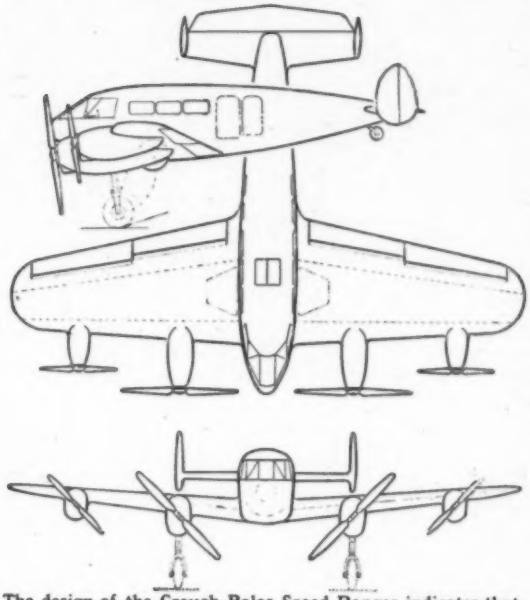
Research is still being carried out in all manufacturing countries on devices for increasing unit lift still further, and some improvement may be possible. When it is made available, however, it will probably be utilised for still higher performance by a further increase in wing loading.

Two Englishmen have been working along quietly on a different line of attack for several years, their preliminary work, as it happens, having been carried out in America, although one of them has now returned to this country. Mr. R. J. Goodman-Crouch and Mr. Harold Bolas "emigrated" to America several years ago and there established a small company for experimenting with a scheme for obtaining increased lift by making use of the slipstream from the airscrews. It had, of course, been known long before that that the portion of a wing situated in the slipstream gives greater lift by virtue of the greater relative velocity of the air. But no one, apparently, had realised that by judicious "wangling" the degree of extra lift might be made to amount to a good deal. Messrs. Bolas and Crouch did suspect this fact and set to work on finding out exactly how much there is in it.

Surprising Results

Their results, from wind tunnel tests and from actual flying tests carried out with a somewhat quaint experimental biplane, indicated that rather surprising "lifts" can be obtained. For the full slipstream effect to be obtained it is, of course, necessary that the airscrews should "cover" the entire wing. If they cover half the wing area, very roughly half the effect is obtained, and so forth. Fortunately for the two inventors the modern tendency in military as in civil aircraft is towards twin-engined and multi-engined machines, and it has been found that to obtain a fairly large percentage of the theoretically possible advantages it is not necessary to go to extremes in the matter of airscrew diameters.

Perhaps it will be recollected that a couple of years ago or so the annual report of the Aeronautical Research Committee referred to the desirability of research into the mutual effects of a large number of airscrews on the leading edge of a wing. The idea was, we believe, connected with large flying boats of 200 tons gross weight in which, with existing power plants, the total horse-power would of necessity have to be provided by a multiplicity of engine units. We are not aware if that research was carried out, or if it still remains a pious hope. Be that as it may, Crouch and Bolas have found that by covering the greater part of a wing with slipstream, and by tilting the airscrew axis downwards, a very great



The design of the Crouch-Bolas Speed-Ranger indicates that little departure from conventionality need be incurred to obtain the full effect of the tilted slipstream arrangement.

increase in lift is obtainable at low forward speeds. Moreover, the angle of airscrew tilt needed to give somewhere near optimum results is not great enough materially to affect the airscrew efficiency at cruising speed. At low forward speeds there is, of course, a considerable degree of slip, so that when the aircraft as a whole is travelling slowly the speed of the slipstream across the wing is high, and the wing obtains the high lift which results from high relative air velocity at large angles of incidence.

That an aeroplane incorporating the Crouch-Bolas ideas need not be unsightly, nor even very unorthodox in appearance, is indicated by the three-view general arrangement drawings of the C.-B. Speed-Ranger, a design which was evolved some time ago.

In this the inboard engines develop 420 h.p. each, while the outboard engines produce 145 h.p. each. The speed range is estimated to be from 245 m.p.h. to 34 m.p.h., or slightly over 7 to 1.

The tapering of the power units has certain advantages, apart from its use in the increase of lift. The distributed load along the wing spars reduces the bending moments, while the fact that the lower-powered engines are outside reduces the yawing moment on the machine in the unlikely event of a stoppage of an outboard engine. Incidentally, the machine is designed to fly on one inboard engine alone.

Mention has already been made of the fact that one of the essential features of the Crouch-Bolas scheme is that the airscrew shaft should make a negative angle with the wing chord On the experimental biplane provision was made for varying this angle in order to determine the optimum arrangement. It was found that the angle need not be very large and that in practice there is no need for such elaborations as tilting engine mountings. The wing itself is slightly more efficient when placed in an airstream tilted upwards a little, the effect being rather similar to that found in a glider soaring in an up-current. This gain in wing efficiency is just about suffi-

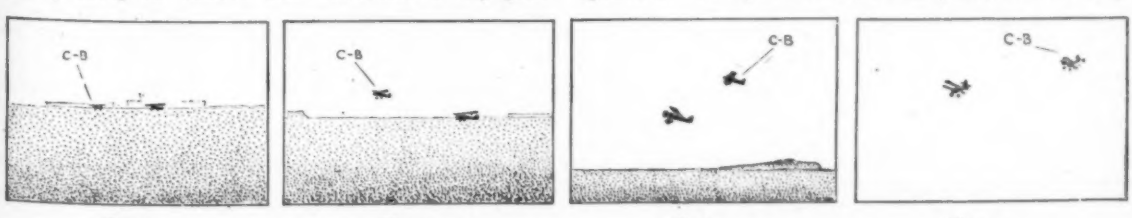


Fig. 1. Fig. 2. Fig. 3. Fig. 4.

Stages in the take-off of the Crouch-Bolas biplane and an orthodox machine. Sketches prepared from a film.

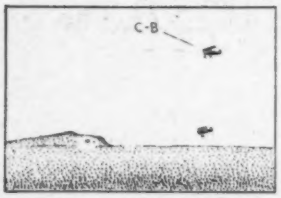


Fig. 5.

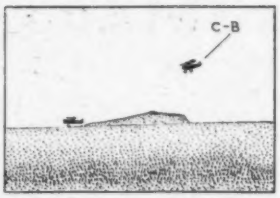


Fig. 6.

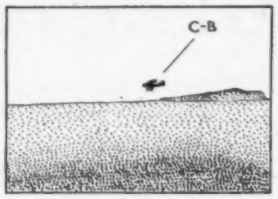


Fig. 7.

Landing approach of the Crouch-Bolas biplane and a conventional biplane. The sketches are accurate copies of an actual film.

cient to offset the very small loss in airscrew efficiency at cruising speed which results from tilting the airscrew axis.

As the increase in lift results from accelerating the air which passes across the wing, it follows fundamentally that it can be superimposed upon and added to the extra lift obtained from such devices as slots and flaps. Calculations based upon research and experiments indicate that an aircraft with the usual modern high-lift devices and tilted airscrews whose swept area covers the greater part of the wing can be expected to give a maximum lift coefficient of 5.0 (or 2.5 in the old "absolute" units). This may seem staggering, until one remembers that in calculating "backwards," so to speak, one takes into account wing loading and forward speed of aircraft (which is low), but not slipstream speed across the wing. In actual figures it means, using the old fundamental formula, $L = W = c_L \rho A V^2$, that for a wing loading of 50 lb./sq. ft. the minimum speed would be about 63 m.p.h.!

That all this is not mere theorising seems to emerge from the flying tests carried out in America with the experimental biplane some time ago. Climbing and gliding angle rather than landing speed were the objects aimed at, and we have pictures from a film taken at the time which shows the take-off and landing of two machines, one the Crouch-Bolas experimental biplane and the other a normal standard American biplane. Both machines had a wing loading of 10.5 lb./sq. ft., and the conventional biplane had considerably more power

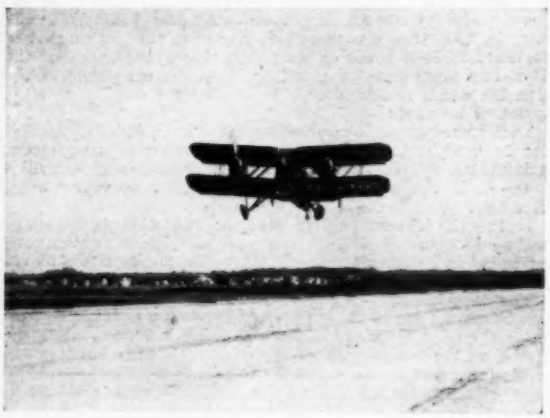


Fig. 8. The Crouch-Bolas biplane in a typical landing attitude.

than the C.-B. Unfortunately, the film pictures are too small and too indistinct for reproduction, but we have had prepared from them the small sketches, which represent quite accurately what the film shows.

Fig. 1 shows the machines taking off together. Four seconds later the Crouch-Bolas machine had left the ground, and Fig. 2 shows it already in the air while the conventionally designed machine is still on the ground.

At a safe height, *i.e.*, when it is permissible to place the machine in what normally would be a stalled attitude, the nose is elevated and the machine is climbed at low forward speed but at the same rate of climb, thus increasing the angle of climb far beyond the normal.

Fig. 3 shows the two aeroplanes in their respective positions at this point, while Fig. 4 gives an indication of the distance travelled by both aeroplanes in order to reach the test height.

In the case of landing the increased angle of descent and the low forward speed and decreased sinking velocity are clearly demonstrated.

Fig. 5 shows the Crouch-Bolas type descending at a steep angle, low forward speed, and low sinking velocity, with the conventional machine still behind it and below it lessening the distance between the two aeroplanes.

Fig. 6 shows the Crouch-Bolas type gliding in with its engines revving at slow speed, so that in the remote event of engine failure the fact that the aeroplane is flying at less than its stalling angle without engines constitutes no increased hazard whatsoever on this score.

The conventional machine, however, with its normal landing speed has been forced to overtake the Crouch-Bolas machine, and is seen in the photograph well in advance of its competitor and already on the ground, commencing its landing run.

Fig. 7 shows the Crouch-Bolas in the process of dropping its tail preparatory to making a low-speed landing, this manœuvre normally being carried out either when in close proximity to the ground or at the time of contact, in order to avoid any possible danger which might arise from the unlikely failure of an engine.

The subsequent landing occupies but a short space, ten to fifteen yards being the average sort of figure.

The position of the Crouch-Bolas when landing is shown in Fig. 8; its attitude can be judged from the position of the tail wheel.

As a result of tests and calculations it is claimed for the Crouch-Bolas scheme that it will:

1. Decrease the time and distance for take-off by 50 per cent.
2. Increase *angle* of climb while retaining the same *rate* of climb, by nearly 100 per cent.
3. Increase the speed range by approximately 75 per cent.
4. Decrease the sinking speed, as distinct from forward speed, to approximately 50 per cent. of that obtained on modern aircraft fitted with wing flaps.
5. Decrease the landing speed and distance run by about 50 per cent.

These characteristics, it is claimed, are achieved without sacrifice of maximum speed, load-carrying capacity or safety characteristics. Control and manœuvrability are retained down to and beyond the stalling speed.

Capt. Goodman-Crouch, who has been back from America for some time, is now in touch with several British aircraft firms, and it may be expected that the Crouch-Bolas scheme will be applied to British machines in the not too-distant future. In the meantime Mr. Harold Bolas is watching the American end of the partnership, and there may soon be developments to report from the other side.

France Builds an Asboth Helicopter

UNDER the title of "Société des Hélicoptères Asboth," a company has recently been formed in France to acquire the licence for the Asboth helicopter. A machine with a 180 h.p. engine is stated to be nearing completion.

Several years ago, in Hungary, Mr. von Asboth built four experimental helicopters, and flights said to have totalled a duration of 30 hours were made. Air Ministry officials, including the late A.V.-M. Sir Sefton Brancker, saw a demonstration in Budapest in 1930.

One projected design was discussed in some detail in *Flight* three years ago. The English company is Asboth Helicopters, Ltd., Cliffords Inn, London, E.C.4.

"Aerolite" Synthetic Glue on the Market

MANY readers will recall the outstanding paper on plastics in aircraft construction, read by Dr. N. A. de Bruyne before the R.Ae.S. in January, 1937. References in that lecture to an obviously remarkable synthetic glue called "Aerolite" will also be remembered.

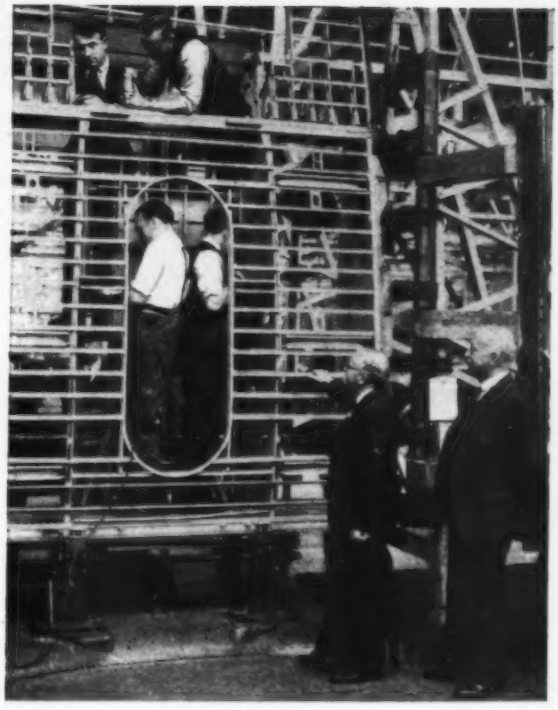
Dr. de Bruyne's organisation, Aero Research, Ltd., Duxford, Cambs, are now marketing "Aerolite," and its properties are described in detail in a booklet recently issued.

Among the claims made are that when a joint made with "Aerolite" glue is tested to destruction it will always show a wood failure; that the glue is truly waterproof, and remains completely efficient even after 18 months' immersion; and that it is simple and economical to use.

"Aerolite," the first glue of its kind to be approved by the Air Ministry, is released by the approved system of inspection of Aero Research, Ltd.

FIRST AUSTIN-BUILT BATTLE

Shadow Becomes Substance at Longbridge



(Above) Sir Kingsley Wood and Lord Austin watch the assembly of a centre section in a vertical jig.

(Right) Sir Kingsley and Lord Austin with — on the left — Sqn. Ldr. T. H. England, who demonstrated the machine.

COVERING more than half a 28-acre site at Longbridge, Birmingham, and built on what had been farm land only two years ago, the Austin aircraft shadow factory has turned out its first aeroplane. For some time the works has been turning out Bristol Mercury engine components. Its aircraft programme is the production of the Fairey Battle, and on July 22 the first completed machine was flown before the Secretary of State for Air by Sqn. Ldr. T. H. England.

After the demonstration Sir Kingsley Wood and Lord Austin addressed a meeting of thousands of workpeople. Later, at a luncheon, Lord Austin said that the flight of the first Battle aeroplane completed in the shadow factory marked the culmination of the first stage in Austin aeroplane production after two years of work, and was, so far as complete aeroplanes were concerned, the first fruit of the Government's shadow scheme. The company had been turning out engines in big numbers for some months.

In achieving its results the company had been stimulated by the realisation of the urgency and paramount importance of the Government's air programme. Production was now going ahead most satisfactorily, and the machine which had been flown that day was only the forerunner of many more Austin-built Fairey Battle aeroplanes. It was the first aeroplane completed in Birmingham since the Austin Motor Company turned out their last batch of fifty machines just after the War.

Sir Kingsley Wood said that the plan of setting up shadow factories would always be associated with the name of Lord Swinton. In turning to the great motor industry this country secured the creation of a new capacity, the introduction of new methods, and the association with aircraft production of men like Lord Austin, who could be ranked among our first captains of industry. That policy was fully justifying itself, and would do so still more in the future. Some £11,000,000 had already been expended on the shadow factory scheme. The shadow factories were employing many thousands in the Birmingham and Coventry area alone, and the aircraft that would be produced would constitute a considerable contribution to our national defence.

Eastbourne Opening

THE official opening of the new clubhouse at Wilmington aerodrome will be carried out by Mr. W. P. Hildred, the Deputy Director of Civil Aviation, on Saturday, August 20.

Among the items for the post-ceremonial display organised by the Eastbourne Flying Club will be a show by pilots of No. 79 (F) Squadron from Biggin Hill, a delayed parachute jump by Mr. Gwynne Johns, and a demonstration by Mr. Henshaw with his King's Cup Mew Gull.

There will be various competitions, including some for arrival and others for longest distance travelled by English and foreign visitors. Capt. Short, the secretary, tells us that he is expecting three or four visitors from Germany and, perhaps, some support from France.

SERVICE AVIATION

Royal Air Force and Official Announcements :

Fleet Air Arm News : Military Aviation Abroad

Changes in the Higher Commands

THE Air Ministry announces the following appointments:—Air Vice-Marshal Paul Copeland Maltby, D.S.O., A.F.C., to be Air Officer Commanding No. 24 (Training) Group, Royal Air Force, at the beginning of August, *vice* Air Vice-Marshal John Tremayne Babington, C.B.E., D.S.O., who succeeds Air Vice-Marshal Arthur William Tedder, C.B., as Air Officer Commanding, Royal Air Force, Far East, in September, 1938.

Group Capt. Francis Edward Philip Barrington to assume command of Royal Air Force, Mediterranean, temporarily in July, 1938, *vice* Air Vice-Marshal C. Maltby.

Air Vice-Marshal P. C. Maltby was born in 1892 in India and entered the Army as a 2nd Lieutenant in 1911, after attending the Royal Military College, Sandhurst. In 1915 he was seconded to the Royal Flying Corps and in 1918 he transferred to the Royal Air Force. In the following year he was granted a permanent commission as a Squadron Leader. He served in France with several squadrons during the Great War, and, in addition to being mentioned in despatches was awarded the D.S.O. and A.F.C. Later he commanded various units in India and in 1925 was appointed to command a Wing Headquarters, Inland Area.

After passing a course at the Royal Air Force Staff College in 1926, he was posted to the Air Ministry for Air Staff duties. In 1931 he attended a course at the Imperial Defence College, and the following year was appointed to command the Central Flying School. In 1935 he was posted to Headquarters, Royal Air Force, Mediterranean, where he has been Air Officer Commanding since June of that year.

He was promoted to Wing Commander in 1925, to Group Captain in 1932, to Air Commodore in 1936, and to his present rank on July 1, 1938.

Air Vice-Marshal J. T. Babington was born in 1891, in London, and joined the Navy in 1908. He was attached to the Naval Wing of the Royal Flying Corps in 1913, and in 1918 transferred to the Royal Air Force. In the following year he was granted a permanent commission in the Royal Air Force as a Squadron Leader.

During the Great War he served both at home and overseas and was awarded the D.S.O. for distinguished service in connection with the attack on Zeppelin sheds at Friedrichshaven in November, 1914. He was also awarded two French decorations for his valuable war services, as well as being mentioned in despatches.

In 1924 he passed a course at the R.A.F. Staff College. In 1925 he proceeded to Iraq for Personnel Staff duties. On return to the United Kingdom in 1927 he was appointed to command the Royal Air Force Base, Gosport. In 1929, after a tour of service overseas in Iraq, he was posted to the Air Ministry and was appointed Air Representative to the League of Nations in November of that year. In December, 1934, he became Air Officer Commanding, Royal Air Force, Halton, and in 1936 he was appointed to command No. 24 (Training) Group.

He was promoted to Wing Commander in 1922, to Group Captain in 1930, to Air Commodore in 1934, and to his present rank in July, 1937. He was awarded the C.B.E. in the Birthday Honours List, 1934.

Group Capt. F. E. P. Barrington was born in Dublin in 1892, joined the Royal Naval Air Service in 1915 as a temporary Flight Sub-Lieutenant. In 1919 he was granted a permanent commission as a Flight Lieutenant.

During the Great War he served overseas and was an instructor at No. 205 Training Depot Section in France. In 1924 he was posted to Headquarters, Iraq, and after his return to the United Kingdom in 1929 he was posted to the Air Ministry. In 1934 he was appointed Chief Instructor to the Cambridge University Air Squadron, and, since November, 1936, has commanded Royal Air Force Station, Kalafrana (Mediterranean).

He was promoted to Squadron Leader in 1922, to Wing Commander in 1931, and to his present rank in July, 1936.

R.A.F. College Passing-out Report

AT the passing-out inspection by Sir John Salmond on July 29 the Commandant of the Royal Air Force College, Cranwell, said that his report covered the period of January to July. In past years this period was counted as one term. Now, owing to the reorganisation of the College into six terms and an admission of three entries a year, the period under review was divided into two terms. Points from the Commandant's report were:—

There are 161 Flight Cadets at present on the strength of the College. The standard of discipline has been satisfactory. Cadet Under-Officers and N.C.O.s have shouldered their responsibilities and displayed keenness and efficiency. The standard of the 28 cadets who entered in January is higher than that of any term which has before entered the College. The standard of the 21 cadets who entered in April is below the usual: this probably arises from the fact that they comprise the first entry to enter the College in April. The standard of the term which is now passing out is, on the average, up to the usual.

In the Flying Training Squadron the general standard of flying has been satisfactory. All cadets now do at least three cross-country flights during the elementary stage of their flying training.

All cadets who passed from the Intermediate to the Advanced stage in April had made three solo landings at night by the aid of floodlights. Since then five more solo landings have been made by each of these cadets, three of them without floodlights.

The Link Trainer has been introduced at the College and two sets of this apparatus have now been received, of which one has been available for instruction during the last term. In future all cadets will receive instruction in the Link Trainer complementary to that which they receive in the air.

The average flying hours of the cadets now passing out are 122 hours solo and 59 hours dual.

In navigation, the syllabus of theoretical work has been curtailed; elementary navigation only is now taught. All Flight Cadets who are posted to fighter or bomber squadrons on passing out will go in future to a navigation course of ten weeks' duration before taking their place in the squadrons. Those who are posted to General Reconnaissance or Army Co-operation units will be given extra instruction in navigation in the special course they attend before they join their units.

In armament, the equipment at the disposal of the instructors is now both modern and adequate. There has been an improvement in the interest shown by Flight Cadets now under instruction. This is probably due to the introduction of modern equipment. A second machine-gun range has also been constructed and is now ready for use.

Of the 35 sixth-term cadets, 33 pass out of the College at the end of this term: two are being retained at the College for a further term owing to the time they have lost in hospital and on sick leave as a result of a motor accident.

AWARDS

His Majesty the King's Medal (highest aggregate of marks in all subjects in the final order of merit following the passing-out examinations).—Flight Cadet C. V. D. Willis (who thus wins for "C" Squadron the *Sir Thomas Berridge Cup*).

The Sword of Honour (best all-round Flight Cadet).—Flt. Cadet Under Officer B. P. Young.

Air Ministry Prize (highest marks in Imperial and War Studies).—Flt. Cadet Under Officer J. E. T. Haile.

Air Ministry Prize (highest marks in Aeronautical Engineering).—Flt. Cadet C. V. D. Willis.

Adby Gerrard Fellowes Memorial Prize (highest marks in Mathematics and Science).—Flt. Cadet Cpl. J. F. Cook.

J. A. Chance Memorial Prize (highest marks in Service Subjects).—Flt. Cadet C. V. D. Willis.

R. M. Groves Memorial Prize (best all-round pilot in the senior term).—Flt. Cadet R. J. Sansom (who thus wins for "C" Squadron the *Kinkead Memorial Trophy*).

E. and W. School Inspection

THE passing-out inspection of the Electrical and Wireless School, Cranwell, was carried out on July 27 by Air Chief Marshal Sir E. R. Ludlow-Hewitt. The following are extracts from the report of the Commanding Officer:—

The strength of the entry now passing out was 123 on arrival in September, 1935. Three were discharged by purchase, one was transferred to a later entry, one was discharged as unsuitable and one died.

The total number of Aircraft Apprentices now passing out is therefore 118, and is comprised of 99 Wireless Operator Mechanics and 19 Instrument Makers.

Wireless Operator Mechanics.—The 99 pupils examined were classified as follows:—Leading Aircraftman, nil; Aircraftman 1st Class, 25; Aircraftman 2nd Class, 68; failed to qualify as Wireless Operator Mechanic, recommended by C.T.T.B. for reclassification to A.C.2 Wireless Operator, Group II, 6.

Instrument Makers.—The 19 pupils examined were classified as follows:—Leading Aircraftman, 1; Aircraftman 1st Class, 9; Aircraftman 2nd Class, 8; failed to qualify as Instrument Maker, recommended by C.T.T.B. for further training with a view to reclassification as A.C.2 Instrument Repairer, Group II, 1.

The entry, as a whole, has done well both in its training and sports, and has displayed an excellent spirit throughout the course.

AWARDS

Prize for Highest Aggregate Marks.—Sgt. Apprentice Bentley, H., Inst. Maker.

Prize for 2nd Highest Aggregate Marks.—Sgt. Apprentice Temlett, C. B., Inst. Maker.

1st Prize, Technical.—Sgt. Apprentice Bentley.

2nd Prize, Technical.—Sgt. Apprentice Temlett.

1st Prize, Educational.—Sgt. Apprentice Bentley.

2nd Prize, Educational.—Aircraft Apprentice Hole, T. E., W. O. Mech.

Awarded Cadetship.—J. M. McDonald, Cpl. Apprentice, and C. B. Temlett, Sgt. Apprentice.

Winner of Hyde-Thomson Memorial Prize.—Sgt. Apprentice Temlett.

Halton Inspection

AIR MARSHAL SIR CHARLES BURNETT inspected No. 1 School of Technical Training (Apprentices) at Halton on July 28.

Points from the Commandant's report were as follows:—

The apprentices now passing out are the 32nd entry to pass into the Service on completion of the course of apprenticeship training. Of the 793 apprentices originally attested for Halton, 6 were discharged by purchase, 6 were discharged "services no longer required," and 19 on medical grounds, while 2 died, 36 were transferred to a junior entry, and 24 were transferred from a senior entry. This left 748 to pass into the Service, and of this number 710 have been trained in the trade of Fitter II and the remaining 38 in the trade of Fitter Armourer.

As the result of the final examinations, 13 aircraft apprentices, representing 2 per cent., of the entry have been classified as Leading Aircraftmen; 443 (60 per cent.) have been classified Aircraftmen 1st Class; 272 (36 per cent.) have been classified Aircraftmen 2nd Class; 14 apprentices failed to qualify.

This is the largest entry of apprentices ever to have passed through the School, but in spite of its numbers, the training has been accomplished without serious difficulty. The "bulk training" scheme in workshops, with certain N.C.O.s of the Wing watching the technical progress of their apprentices, has worked quite well.

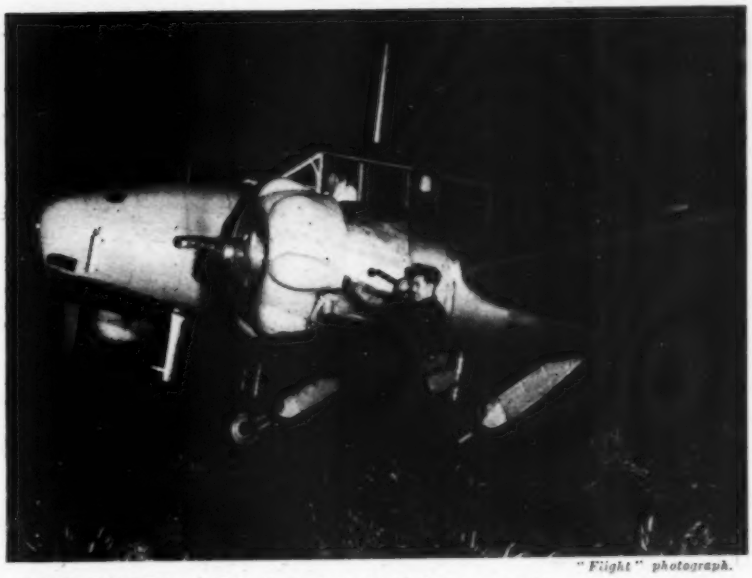
The health of this entry has been very good. An analysis of figures shows that the average time lost per apprentice through sickness was 75 hours. This figure compares very favourably with previous entries and the physique of the entry must be considered well up to standard. The general standard of discipline has been good throughout and the drill has been well up to the average standard. The entry has maintained a very high standard in games and quite a number have been outstanding.

LIST OF AWARDS

Grand Aggregate:—
1st Prize, Sgt. App. F. R. Bird; *2nd Prize*, L./A.A. G. Hampton; *3rd Prize*, Sgt. App. T. J. F. Davey.

Educational Subjects:—
1st Prize, L./A.A. G. Hampton; *2nd Prize*, A.A. H. Brown.

Fitter II:—
1st Prize, Cpl. App. A. S. Will; *2nd prize*, Cpl. App. J. A. Walters; *3rd Prize*, Sgt. App. D. C. Sharman.



"Flight" photograph.

DAWN PATROL: A G.R. Anson being started up at 03.00 hours during the recent Coast Defence Exercises.

Fitter Armourer:—Cpl. App. T. Taylor.
Elliott Memorial Prize.—L./A.A. G. Hampton.
Crebbin Robinson Cup:—A.A. A. J. Sparling.
Cadetships:—Sgt. Apps. F. R. Bird, T. J. F. Davey and D. C. Sharman.
Viscount Wakefield Scholarship:—Sgt. App. F. R. Bird.

O.T.C. Flying Facilities

OFFICERS Training Corps at a great many public schools now have Air Detachments, and last week all these air cadets were in camp near Tidworth. They were given flights by aircraft from Boscombe Down and Odiham and have been visiting a number of R.A.F. stations, these activities being on a far larger scale than in past years. Each detachment has some parent station or squadron in the R.A.F. which makes itself responsible for carrying on the good work during the year.

Royal Air Force Gazette

General Duties Branch

The following Flying Officers are granted the acting rank of Flight Lieutenant on the dates stated:—R. H. Spencer (April 5); M. M. Kane, F. L. Newall, A. E. Saunders (May 19); J. Darwen (June 14).

Equipment Branch

F/O. G. Thornton, M.M., is promoted to the rank of Flight Lieutenant (April 19).

Dental Branch

The following Flying Officers are promoted to the rank of Flight Lieutenant (May 3):—A. J. Clegg, L.D.S., J. F. M. Sampson, L.D.S.

Memorandum

The permission granted to E. Bryant to retain the rank of Lieutenant is withdrawn on enlistment in the Territorial Army (May 10).

Royal Air Force Reserve

Reserve of Air Force Officers
General Duties Branch

H. E. Greenberry is granted a commission as Flight Lieutenant in Class C (February 16): Flt. Lt. F. T. Eades, D.F.C. (R.A.F. ret.) is granted a commission as Flying Officer (Honorary Flt. Lt.) in Class C (April 4).

Royal Air Force Volunteer Reserve

Medical Branch

C. J. Shortall, M.D., M.Ch., F.R.C.S.(I.), is granted a commission as Flight Lieutenant (July 26).

Auxiliary Air Force

General Duties Branch

No. 501 (COUNTY OF GLOUCESTER) (B.) SQUADRON.—Air Vice-Marshal His Royal Highness Henry William Frederick Albert, Duke of Gloucester, K.G., K.T., K.P., G.C.M.G., G.C.V.O., Personal A.D.C. to the King, is appointed Honorary Air Commodore (July 14).

No. 905 (COUNTY OF SURREY) (BALLOON) SQUADRON.—Major W. G. Horne is granted a commission in the squadron (July 5).

Royal Air Force Appointments

General Duties Branch

Air Commodore.—R. G. Parry, D.S.O., to H.Q., Coastal Command, Lee-on-the-Solent; on appointment as Air Officer in Charge of Administration, 18.7.38.

Wing Commander.—C. P. Brown, D.F.C., to Directorate of Staff Duties, Air Ministry, 4.7.38.

Squadron Leaders.—N. Young, to R.A.F. Station, Lee-on-the-Solent; for flying duties in the Storage Section, 14.7.38; C. E. Morse, to School of Air Navigation, Manston, 5.7.38; C. B. Wincott, to Directorate of Technical Development, Air Ministry, 6.7.38; J. H. T. Simpson, to No. 3 F.T.S., South Cerney; for Engineer duties, 12.7.38; R. J. Clare-Hunt, to H.Q., No. 5 (Bomber) Group, Grantham, for Air Staff (Intelligence) duties, 8.7.38; M. E. M. Perkins, to H.Q., Bomber Command, Uxbridge; for Engineer Staff duties, 15.7.38; A. C. Watson, to H.Q., No. 22 (Army Co-op.) Group, South Farnborough; for Signals Staff duties, 18.7.38. H. R. Dale, to H.Q., Maintenance Command, Andover; for Air Staff duties, 18.7.38.

Flight Lieutenants.—To School of Air Navigation, Manston, 5.7.38:—J. P. Selby, R. A. I. Harrison, J. A. K. Pettitt, H. J. Hobbs, G. A. V. Clayton, H. R. Graham, D. G. Stokes, C. L. Y. Wright, W. S. Jenkins. C. W. Williams, to Deputy Directorate of Intelligence, Air Ministry, 14.7.38; P. N. J. Wilkins, to No. 90 (B.) Sqn., Bicester, 4.7.38. D. A. Gibson, to Reception Depot, West Drayton, 18.7.38. P. J. A. Riddell to No. 142 (B.) Sqn., Andover, 17.7.38; H. S. Darley, to No. 602 (City of Glasgow) (B.) Sqn., 20.6.38; J. G. Macintyre and H. C. Sawyer, to R.A.F. College, Cranwell, 16.7.38. Lt. H. P. Bramwell, R.N., and Lt. R. C. Tillard, R.N., to H.Q., No. 26 (Training) Group, Hendon, 16.7.38. A. Foord-Kelcey, to No. 2 F.T.S., Brize Norton, 16.7.38. E. H. P. Clarke and R. V. L. Pattison, to No. 3 F.T.S., South Cerney, 16.7.38. E. M. Donaldson, to No. 6 F.T.S., Netheravon, 16.7.38.

Equipment Branch

Squadron Leader.—L. Horwood, M.C., to H.Q., Maintenance Command, Andover; for Equipment Staff duties, 17.7.38.

Chaplains Branch

Rev. D. C. E. Rogers, to No. 1, R.A.F. Depot, Uxbridge; for duty as Chaplain (C. of E.), 28.6.38.

Medical Branch

Squadron Leader.—H. Penman, to No. 2 School of Technical Training (Apprentices), St. Athan, 15.7.38.

Owing to the greatly increased length of these lists as a result of R.A.F. expansion, ranks are confined to those of Flight Lieutenant and above

THE FOUR WINDS

ITEMS OF INTEREST FROM ALL QUARTERS

TRICYCLE HURRICANE : An amusing snap at Northolt when the Hurricanes of No. 111 (F.) Squadron were taking off for their recent Paris visit.

THE Navy League and Air League have decided to co-ordinate much of their work. Each League will retain complete independence of organisation.

In connection with the Paris Aero Show (November 18-December 4), the Third Air Transport Congress is being organised by the Aéro Club De France.

Miss Jean Batten was presented recently with the Harmon Trophy. Similar awards are made each year to one airman, one airwoman, one airship pilot, and one balloonist.

According to our contemporary, *Aviation*, the Boeing 314 flying-boat (82,500 lb. all-up weight) was revealed at her official weigh-in to be within 50 lb. of the designed figure. And that 50 lb. was on the right side.

Mr. C. E. Walker has been appointed adviser to the Director-General of Production, Air Ministry, on questions concerning the production of raw material. Mr. Walker was, until recently, a director of J. Stone and Co., engineers and founders, and during the War carried out special work for the Admiralty.

The Air League of the British Empire announces that the Air Ministry has approved the uniform for the Air Defence Cadet Corps, of which Marshal of the Royal Air Force Sir John Salmond is chairman.

The uniform consists of a blue forage cap, tunic and trousers with black belt. Buttons are chromium and bear the Air League badge. Each of the squadrons now being formed will consist of 100 cadets. Young men between the ages of 14 and 18 are eligible.

Good progress is reported. Sqn. No. 1 has been formed at Leicester and No. 2 at Watford. Each unit contains cadets who have been selected and approved by the local committees of the Air Defence Cadet Corps.

The Breguet Company, whose plants are nationalised, have transferred their gyroplane patents to a newly formed company, the Société Francaise du Gyroplane, with a capital of 3,000,000 francs.

It is reported that the shipbuilding company, known as Chantiers et Ateliers de St. Nazaire is represented on the board.

The training of R.A.F. pilots is the subject of a new British screen feature called *Inside Goods* and recently presented in London. The Air Minister, Sir Kingsley Wood, gives a short address incorporated as a prologue.

Two new Stinsons have been ordered by the Ontario Air Service, the Government forest fire protection organisation. The total number of machines used for forestry work is 28, and the service has been in operation 12 years.

According to draft proposals of a proposed new General Powers Bill submitted and confirmed at a recent meeting of the Brighton Town Council, powers are to be sought for the control of noisy advertising aircraft.

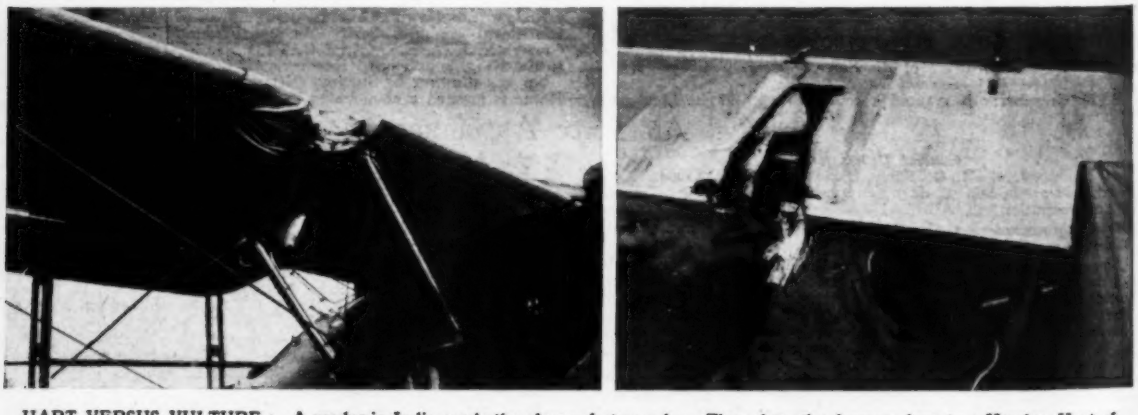
The Hamilton Standard Propellers division of United Aircraft Corporation announces that T.W.A. has ordered Hydromatic quick-feathering propellers for installation on its entire fleet of Douglas DC 3 transports. When this installation is completed, all three major transcontinental airlines (T.W.A., United, and American) will have Hydromatics on their DC 3s.

A meeting has been held in Moscow to discuss the subject of fast airlines to Siberia. It is the outcome of the flight carried out recently by the Soviet pilots Kokinakki and Brandynski, who started from Moscow at 09.36 hours one day and landed at Vladivostok at 09.12 hours on the following day, having covered the distance of 7,600 km. non-stop. The trip was made in one of the new fast transports designed by M. Iljushkin.

Twenty-five Years Ago

From Flight of August 2, 1913

"News has come during the week of the first success of aircraft in war at sea . . . the Mexican gunboat *Tampico* has been destroyed by a bomb dropped from an insurgent aeroplane . . . the warship was blown up at the fourth attempt."



HART VERSUS VULTURE : A reader in India sends the above photographs. They show the damage done to a Hawker Hart of No. 11 (Bomber) Squadron, stationed at Risalpur, which struck a vulture while making a circuit before landing. The bird hit the starboard top main plane as shown in the left-hand view and the remains passed back under the wing, striking and bending a landing wire so that it had to be replaced. Half of the bird remained there and the rest struck the tail plane as shown on the right. These vultures normally have a span of about 6ft. and weigh between 20 and 30 lb.

COMMERCIAL AVIATION

DENMARK'S BIGGEST: On Thursday of last week D.D.L.'s first Focke - Wulf Condor was brought over to Croydon by way of an introduction to its use on the regular Copenhagen-London run. This is the first time that the attractive Danish flag has been flown from a commercial machine at Croydon.

THE WEEK AT CROYDON

"A. Viator's" Causerie on Airline Affairs at London's Main Terminal and Elsewhere

AFTER the Civilian Bank Holiday, a three-day beano has been announced for those hard-working R.A.F. fellows. Bounded on all sides by everything calculated to make it more difficult for those with a job of work to do (I refer to the oppressed merchant skippers of the air) an enormous area has been set aside as a sort of aerial Hampstead Heath and over the whole of this area picnics of a military nature will be held for three solid working days.

During that time a very important and highly-frequented international trade route is to be absolutely forbidden to those air companies whose lawful occasions cause them to use it some eleven or twelve times a day in each direction. It will be impossible for British, Dutch, Czechoslovakian, Danish, Swedish or German services flying from London *via* Amsterdam to various parts of Europe, or direct *via* Hamburg to Scandinavia, to keep schedule, for they all have to fly *via* Cape Gris-Nez, very many miles off their course.

This puts them all on to the already congested Southern route, used by Imperials, Air France and others, and the authorities already warn us that more delay in getting in and out of Croydon will be the result of all this, if there happens to be QBI in force. As a fairly ordinary delay, after approximately 70-minute journeys from the nearer European capitals, is 50-60 minutes, we have jolly times before us.

Not content with games of ring-a-ring of roses within the vast land area, the authorities have scheduled a stretch of the North Sea as a danger area, where presumably they will play "pocketful of posies" or posers, if the weather is not too kind and navigation is not too good.

Incidentally, they are by no means sticking to territorial waters in the North Sea, and the "terror area" links up with the Dunkerque prohibited area so that North-bound aircraft on, I emphasise, their lawful occasions, must fly some miles inland over France.

I am by no means grumbling, of course, for I am informed that no consideration can be shown to commercial interests because this picnic is a military necessity. All I am doing is praying for those in peril on the sea, in case the Royal Navy, equally reasonably, should spread confusion in similar manner along the trade routes of the Merchant Service. On land the Royal Tank Corps, solemnly quoting military necessity, may at any moment camp out across the Brighton road, preferably at a week-end, and I quite expect to hear that some anti-aircraft battery has clamped down its guns on the permanent way of the L.M.S. railway. No true patriot will complain, of course, and for my part, I earnestly, most earnestly, hope it will keep fine for our gallant airmen, especially in the North Sea.

Conferences—New Style

After the return to Denmark of D.D.L.'s new Condor (see p. 110), the machine was used by the City Council of Aalborg, Jutland, for an hour's meeting in the air, during which thirty items of business were dealt with. So we come to the era of the Flying Board Room (a job for Heracles on retirement, or on reaching the age limit?), where one may hope that the purity of the upper air may clear the brains of those who thrive at such meetings, where superb air conditioning may prevent the usual hot air miasma, and where the ejection of any unruly interrupter will be final and decisive—parachutes being worn, of course.

Besides, think how convenient it would be in certain cases. "Gentlemen," the Chairman might end up staggering slightly as the machine hit a bump, "I have placed the position plainly before you and it amounts to this. We must flee the country. George," turning to the pilot, "point her nose to Bankruptania, the State from whence there is no extradition."

Bank Holiday air traffic has been phenomenal this year. Watching the flow of passengers to Paris and Le Touquet on the Saturday with one of the air line chiefs, both he and I were struck simultaneously with the conviction that these were of a type not normally seen on the air routes. They were not the idle rich, but a slightly seedy imitation; they were wearing the same piebald shoes and slightly skewbald expression; wearing the same red carnation, though slightly wilted, and behaving in the same peevish, inane manner, but slightly overdone.

One felt that they might have spent the year saving and scraping for this one opportunity to ape a type it would be better not to flatter in this manner. Let us hope they get their money's worth. Me for the four-ale bar, where men forgather.

So certain have we become of the Bank Holiday traffic that Imperial Airways, for example, issue special time-tables. Air France, from the Friday to the Tuesday, scheduled no less than sixty services in and out; and Imperial Airways, with bigger seating capacity, have as many as forty-six in the same period.

British Airways, at Heston, have flown to full capacity with every machine they possess, and they noted that amongst the usual rush of passengers to nearer Continental resorts there were quite a number of week-enders who did not find Scandinavia (Stockholm is only seven hours away) too far afield. Thursday to Tuesday cheap, no-passport travel to Paris also proved a great attraction.

All companies duplicated and triplicated to Le Touquet, and Olley Air Service ran fourteen services out and back to Deauville on the Friday and Saturday instead of the usual two.

Wrightways had a family party of unusual size for Dinard on Saturday. It consisted of father, mother, three daughters—Mavis, Thelma and Iris—a married son and his wife, three boys aged respectively 10, 13 and 14, a youngster aged 13 months, and, finally, a nurse.

K.L.M. ran, as usual, on these occasions, with fully loaded machines, though experienced no definite Bank Holiday rush, but I saw duplicated Swissair services, a couple of Douglas D.C.3s giving a capacity of forty-two seats.

Imperial Airways on their Swiss run had a party of ten Etonians wearing neither Eton collars nor jackets, to the disappointment of the assembled multitude. It is not known whether the machine made a detour via Waterloo so that the lads could see the sort of thing that may be won on their home playing fields.

The "Hawaiian Clipper"

AT the time of going to press there is still no news of the Pan-American Martin flying-boat which is missing between Guam and Manila on the transpacific service. A patch of fluid, containing both oil and petrol, has been found near the Philippine Deep, but there is no sign of any wreckage. The patch may be the result of fuel dumping prior to making an emergency landing, but in that case the boat's radio should still be in action on the fixed aerial.

The *Hawaiian Clipper* left Guam on July 28 with six passengers and a crew of nine, and the last message from her commander, Capt. Terletsky, explained that she was flying at 9,000ft. through rain and rough air, and gave a position which was approximately half-way between Guam and Manila. Search by surface vessels and by Army and Navy amphibians and bombers has been carried out continuously.

Another Merger

THE Olley group, which includes, in addition to Olley Air Service, Channel Air Ferries and Air Commerce, has now, it appears, officially joined forces with Railway Air Services. This move has for some weeks been rumoured. The merger will automatically stop the competition which has previously been in existence over the South Coast routes, such as that between Brighton and Cardiff, and will simplify booking arrangements on the through services. The route between the North of England and Plymouth, for instance, will now be virtually part and parcel of that previously operated by Channel Air Ferries between Plymouth and the Scilly Islands. For the moment it appears that the headquarters of the new merger company will be at Shoreham.

All Up to Australasia

A WEEK ago to-day the Imperial Airways Empire flying-boat *Calypso* left Southampton Water with its complement of passengers and two tons of mail. That by itself is in these days a commonplace occurrence, but *Calypso's* departure was to be remembered, for it marked the inauguration of the no-surcharge air mail service to Australia, New Zealand and British territories both in the East Indies and the Pacific. In future letters at the normal 1½d. rate will reach Sydney in 9½ days. All first-class mail to Australia will travel this way, but mail to New Zealand will, for the time being, be shipped across the Tasman Sea from Sydney. It is hoped that within a few months the trans-Tasman air service will be inaugurated, and so forge the last link in the through service to New Zealand.

This important occasion was marked by a special ceremony performed under the chairmanship of Sir John Reith on the quarter-deck of the *M.V. Medina* before many important guests. Sir Kingsley Wood, Secretary of State for Air, handed to Major Tryon, the Postmaster-General, letters from the King addressed to the Governors-General of Australia and New Zealand. After Major Tryon had stamped them, they were then placed in special silk mail bags, sealed and handed over to Capt. E. H. Atwood, *Calypso's* commander, who departed amidst cheers from the assembled company.

In a speech brimful of impressive facts, Major Tryon mentioned that there would now be five despatches of Empire air mail every week to India and three to both Malaya and Australia. He went on to say that about thirteen tons of mail a week had been leaving Southampton and in future there would be about twenty tons a week.

With a slickness that would be the envy of any sailor, *Calypso* taxied out of the special boarding raft into the fairway for her take-off. In the meantime, another Short boat, *Calpurnia*, arrived opposite the raft so that the guests should have an opportunity of going aboard.

Atlantic Return

MERCURY, the upper component of the Short-Mayo, reached Hythe at 8.12 p.m. on July 27 after its return flight from New York.

She left Boucherville, Montreal, for Botwood, Newfoundland, at 4.50 p.m. B.S.T. on Monday, July 25, after the flight from New York on the same day. From Botwood, piloted, of course, by Capt. Bennett, she made good time on the following day to the Azores, where she landed at Horta 7 hr. 33 min. afterwards. The final two stages were also made in exceptionally good time, and the machine was not, in fact, expected at Southampton until July 28. She left the Azores at 7 a.m. on July 27, reached Lisbon in 6 hours, and covered the final 930 miles to Southampton in 5½ hours. Overall, her average speed was more than 160 m.p.h. for the entire return trip.

Southampton After All

A DECISION was reached by the Southampton Harbour Board last Thursday, and an official announcement made by Sir Kingsley Wood in Parliament on Friday, to the effect that the permanent Empire air base would be arranged in Southampton Water.

A stretch of water a mile long and 1,200ft. wide on the Netley side of Southampton Water will be reserved for the Empire boats, while the passengers will go aboard at the docks, and the maintenance and repair work will be carried out, as at present, at Hythe. The Air Ministry will, it is proposed, control the flying operations, in their relation to shipping, from an observation tower on the Hythe shore. The Board will receive landing dues from the flying boats, but the cost of dredging the area will be borne by the Ministry.

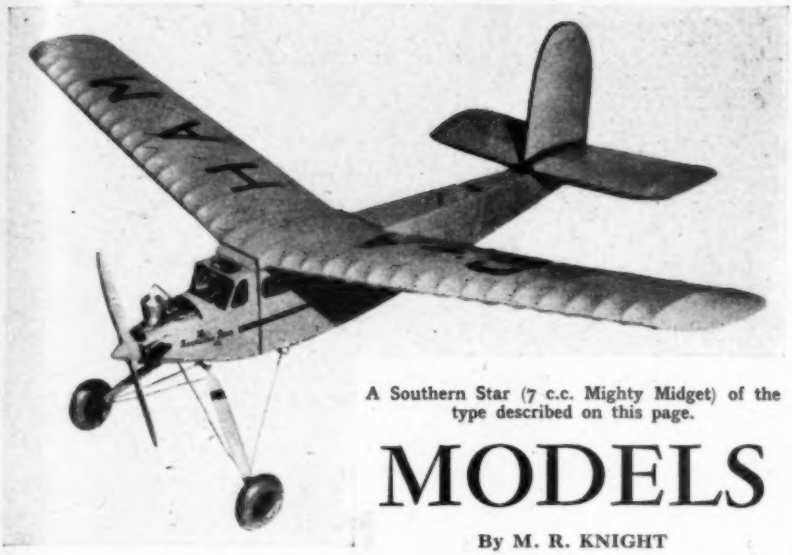
Apart from other criticisms and difficulties of this project (which are duly aired in editorial comment on page 94), the use of Southampton Water means that much of the reason for the choice of Victoria for the site of Imperial Airways' new London terminal, which is now nearing completion, has disappeared. The site was chosen at least partly because of the electric railway service to Portsmouth.

D.D.L. Preliminary

HAD it not been for the fact that the German company, D.L.H., had already brought their first Focke-Wulf Condor to Croydon a few weeks ago, rather more general interest might have been shown in the arrival, last Thursday, of the Condor, of which Det Danske Luftfartselskab, the Danish Company, has recently taken delivery for use on the Copenhagen-London and Copenhagen-Berlin runs.

Last Thursday's was by way of a propaganda preliminary flight, and the machine carried, among other notabilities, H.R.H. Prince Axel of Denmark. In the evening an informal cocktail party was given at the Dorchester.

The actual service, which will be operated in pool with D.L.H., will probably start in about a month's time. At the moment D.D.L. have only one Condor, and the German company is not yet ready to put this type of machine on the regular services. As explained in last week's issue, D.D.L. will probably order another of these machines to be delivered in September, and D.L.H. will very shortly have a sufficient number of them to operate both the Berlin-London and the Copenhagen-London services. When the latter is started, machines will leave Croydon at 8.45 a.m. and Copenhagen at 11.45 a.m., with connections to Oslo in each direction



A Southern Star (7 c.c. Mighty Midget) of the type described on this page.

MODELS

By M. R. KNIGHT

Petrol Power Panorama

SUBSTANTIAL progress in all directions has been made with petrol-engined models in recent months. Three years ago five of these craft flew at Heath Row in the S.M.A.E. contest for the Sir John Shelley Cup, and lulls of an hour between attempts were not uncommon. This year the same contest attracted thirty-six entries, and with the forty-one entered for the Bowden Trophy, models were continuously in the air from 11 o'clock until dusk. With the exception of two biplanes all the machines were of the well-tried high-wing type, and ranged from the 40 in. span 1¼ lb. Satellite (2.4 c.c. Trojan) of Mr. E. Ross to the 9 ft. span 6 lb. monocoque of Mr. A. Wilson. The biggest engine was an inverted 15 c.c. Atom Minor in Mr. W. E. Evans' high-wing model. This machine has made over one hundred flights without untoward incident. One model folded its wings and disintegrated as it hit the ground, but otherwise mishaps were confined to a few cases of overturning in taking-off in the choppy wind which sprang up at the close of a perfect day.

The S.M.A.E. has formulated sound rules for the safe operation of petrol-powered craft. Flying is barred from public open spaces, a time switch limiting the engine run to two minutes must be employed, and every model must bear its official S.M.A.E. registration. Both the Bowden and the Shelley contests were designed to promote reliability and control, and officials and competitors went about their business in a manner calculated to inspire confidence in the S.M.A.E. management of power flying.

The assembled company was welcomed over the microphone by Mr. Richard Fairey, president of the Hayes and District M.A.C.

The Bowden Trophy

IN the Bowden International contest three unassisted rise-off-ground flights of 40-60 sec. were stipulated with loss of points for duration above or below this range. Failure to start the engine within three minutes of the competitor's name being called involved disqualification in that round. Extra points were awarded for an undamaged or only slightly damaged model.

The absence of foreign entries was understandable in a year when the Wakefield contest is not being held in this country. Two competitors scored 120 points, and three further flights were made before Mr. E. Ross (Essex Power M.A.C.) was able to beat his opponent and win the cup. He flew a Southern Star, a picture and brief description of which appear on this page. The runner-up was Mr. L. A. George, of the Hayes Club, whose modified American-type constant-chord high-wing (6 c.c. Baby Cyclone) was characterised by the small amount of dihedral.

Mr. S. T. Grant's 5 ft. biplane Grampus, though scarcely a thing of beauty, flew exceptionally well. It is hoped to publish a description in due course. Certain contestants found the flat glide of their models a difficult factor in securing the stipulated flight duration. For instance, Mr. T. W. Longley (R.A.F., Halton) obtained a flight of 88 sec. with a 15 sec. engine run, and only kept within the required range by setting the time switch for 10 sec. Several other British-built American designs shaped well, including Mr. S. R. Crow's 5 ft. 6 in. cabin high-wing Buccaneer, Mr. P. W. Clempson's 7 ft. 6 in. Super-Buccaneer, and Mr. R. Brigden's Zephyr, a 6 ft. cabin high-wing with typically American wing, constant chord for the major portion of the span, and sharply dihedralled elliptical tips.

The Sir John Shelley Cup

THE Shelley Cup rules called for two flights of 60 sec. and one of 45 sec., with loss of points for duration above or below these figures, and complete forfeiture for a landing beyond the aerodrome boundary. Three competitors scored 57 points, and an additional "nearest to 45 sec." attempt was imposed to decide the winner. This proved to be Mr. J. S. Wreford (Essex Power M.A.C.), who achieved 47 sec. with a constant-chord high-wing of his own design. It had a span of 5 ft. 11 in., an overall length of 4 ft. 9 in., 781 sq. in. of wing-area, and a total weight of 4 lb. 12 oz. The fuselage was of hardwood, silk covered, and wings and tail of balsa covered with bamboo paper. An inverted American 9 c.c. Ohlsson was employed.

Mr. F. J. Almond (N. Kent M.A.S.) secured second place with a constant-chord high-wing of original design, weighing 4 lb. 5 oz. and powered with an American 7½ c.c. Gwin Aero. The span was 6 ft. 9 in., the chord 10 in., and the section RAF 32, balsa, spruce, and hard plywood were the constructional materials, the covering being bamboo paper finished with aluminium dope. Mr. J. C. Gardner (Banbury D.M.A.C.) came third with an original high-wing of about 7 ft. span.

A Winner

THE Southern Star, with which Mr. Ross won the Bowden Trophy, is a small cabin version of his 1936 Shelley Cup winner, which was described in *Flight* of September 3 of that year. Built for heavy duty, spruce has been substituted for balsa for all parts except the ribs. The covering material is Jap silk, doped, and finished with cellulose paint.

The two-piece wing has a span of 6 ft. 6 in. and a section 1½ times the depth of Clark Y. A backswept leading edge tapers the chord from 8 in. to 11 in. The tailplane has a lifting section, but is set at 2 deg. negative incidence. Brass rods projecting from the fine-base pass through the tail-plane and through plywood plates in the fuselage and are secured with nuts. The American 7 c.c. Mighty Midget normally turns the satin-walnut airscrew of 14 in. diameter and 8 in. pitch at 3,000 r.p.m., but full throttle gives 7,000 r.p.m. The model weighs 3¼ lb., and the wing loading is 7½ oz. per sq. ft.

* * *

The Lady Shelley Cup has been won in a "nearest to 45 sec." seaplane contest held by the S.M.A.E. at Danson Park by Mr. T. W. Wickens (N. Kent M.A.S.). He clocked 44.5 sec. rise-off-water with a constant-chord high-wing cabin model of 33 in. span, 129 sq. in. loading and 23 in. overall length. Three flat-bottomed floats were used. An airscrew of 12 in. diameter and 12 in. pitch was turned by five strands of ¼ in. Pirelli rubber.

* * *

The N. Kent Model Aircraft Society will hold a flying-boat contest for the Roberts Trophy at Danson Park, Welling, at 3 p.m. on October 2. A member of this club, Mr. H. Sayers, recently achieved an unassisted rise-off-water flight of 37 sec. with a 10½ oz. boat with a rubber skein in a nacelle under each wing.

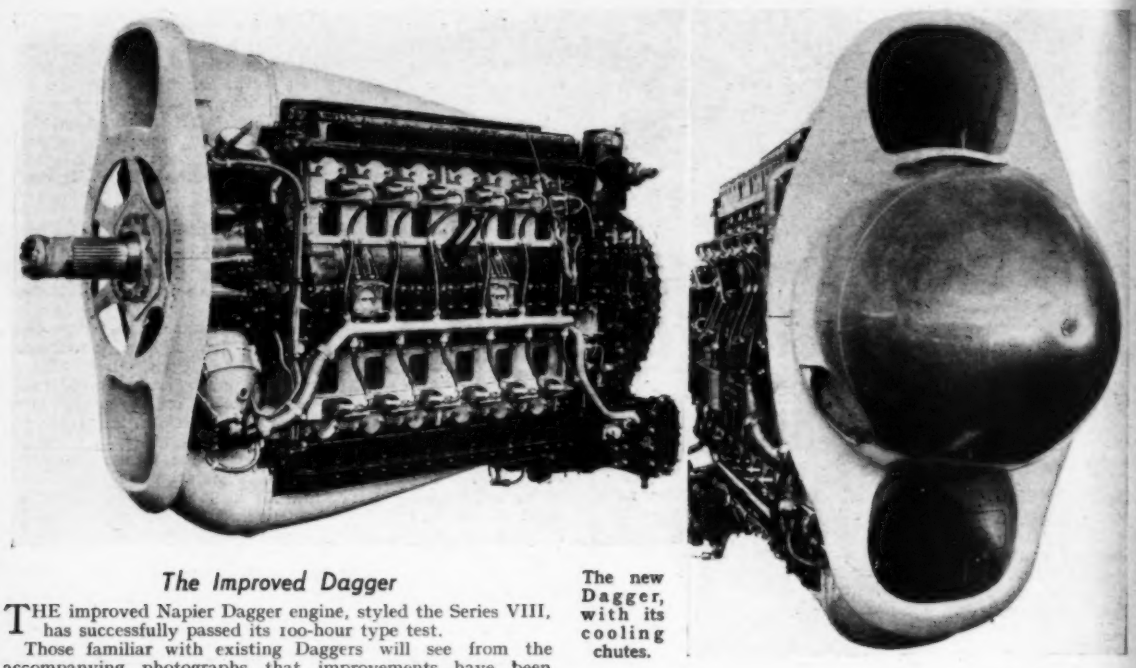
* *

A message from Dr. A. P. Thurston, president of the S.M.A.E., announces that Great Britain has won the King Peter Cup and all first prizes in the contest just concluded in Yugoslavia. Eight countries participated. Mr. R. Copland (Northern Heights M.F.C.) is understood to have set up a world record. The other Britishers were Messrs. R. N. Bullock and E. Chasteneuf (Blackheath M.F.C.) and J. Worden (T.M.A.C.). The British team was enabled to attend in person through the munificence of Lord Wakefield.

Petrol Progress : Safety Regulations

IMPROVED—and APPROVED

Two Power Units of Contrasting Sizes



The new Dagger, with its cooling chutes.

The Improved Dagger

THE improved Napier Dagger engine, styled the Series VIII, has successfully passed its 100-hour type test.

Those familiar with existing Daggers will see from the accompanying photographs that improvements have been introduced, such as a larger double-entry supercharger, increased cooling fin area, complete ignition screening, provision for a D.H. Hamilton constant-speed airscrew, S.U. carburetter with automatic mixture control, and electrically energised inertia starter. Nose-cowl and air chutes are included.

Some seven inches in the overall length has been saved.

Using 87-octane fuel, performance is as follows :—

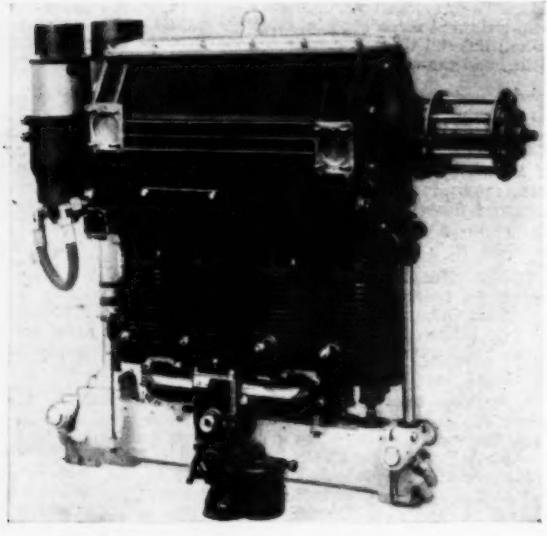
Maximum Power.—1,000 b.h.p. at 8,750 ft., and 4,200 r.p.m. with 5 lb. boost.

Take-off Power.—955 b.h.p. at 4,200 r.p.m. with 6 lb. boost.

Climbing Power at Sea Level.—845 b.h.p. at 4,000 r.p.m. with 4 lb. boost.

Maximum Cruising Power.—770 b.h.p. at 3,600 r.p.m. with 3½ lb. boost.

Maximum r.p.m.—4,200.



Neat and light—the Pixie four-in-line.

Pixilation

SINCE the acquisition of the manufacturing and selling rights of the Mark I and II Weir engines by Acro Engines of Bristol (as recently reported in *Flight*), it has been decided to rename the series. "Pixie" will be the name by which the 40-50 h.p. air-cooled unit will be known, and a limited number is being produced for delivery within four months. The engine has been fully type-tested and has received the Air Ministry's Civil Type Test Certificate. The power rating at 2,350 r.p.m. is 45 h.p. (max., 50 h.p. at 2,625 r.p.m. In future, subsequent types will carry such designations as Puck, Pan, Zephyr, Eros and Ariel.

Sheet-metal Specialists

FOR many years the firm of H. and A. Williamson and Co., Ltd., of 78, Brewery Road, London, N.7, has specialised in sheet-metal work for aircraft, and in recent years it has devoted special attention to the production of both fuel and oil tanks. Following the recent long-distance record gained by four Vickers Wellesleys, it is interesting to learn that several of the fuel tanks in these machines were produced by this firm at its Islington works, where two and sometimes three A.I.D. inspectors are in attendance. Tanks have also been made for other Vickers aircraft, including the Spitfire.

With a staff of fully qualified and approved welders, specialising in various types of metal, and with the most modern plant, which includes hydraulically operated riveting machines, and presses and spot-welding plant, Williamson and Co. have been able to reduce costly overhead charges to an absolute minimum. Incidentally, this company's plant can deal with work under De Bergue riveting patents as well as that requiring soldering and welding. As a result the company has been able to fulfil contracts for such varied items as radiators, oil coolers, exhaust pipes, fairings, wheel covers and military equipment involving sheet-metal work.

Credit Due

TO those suppliers of components and equipment who are given credit for their share in the Short-Mayo Atlantic achievement should be added H. M. Hobson (Aircraft and Motor) Components, Ltd., who were responsible for *Mercury's* and *Maia's* carburation; Brown Brothers (Aircraft), Ltd., who supplied a number of A.G.S. parts for the two aircraft; and Exide Batteries, whose batteries were used in *Mercury*.